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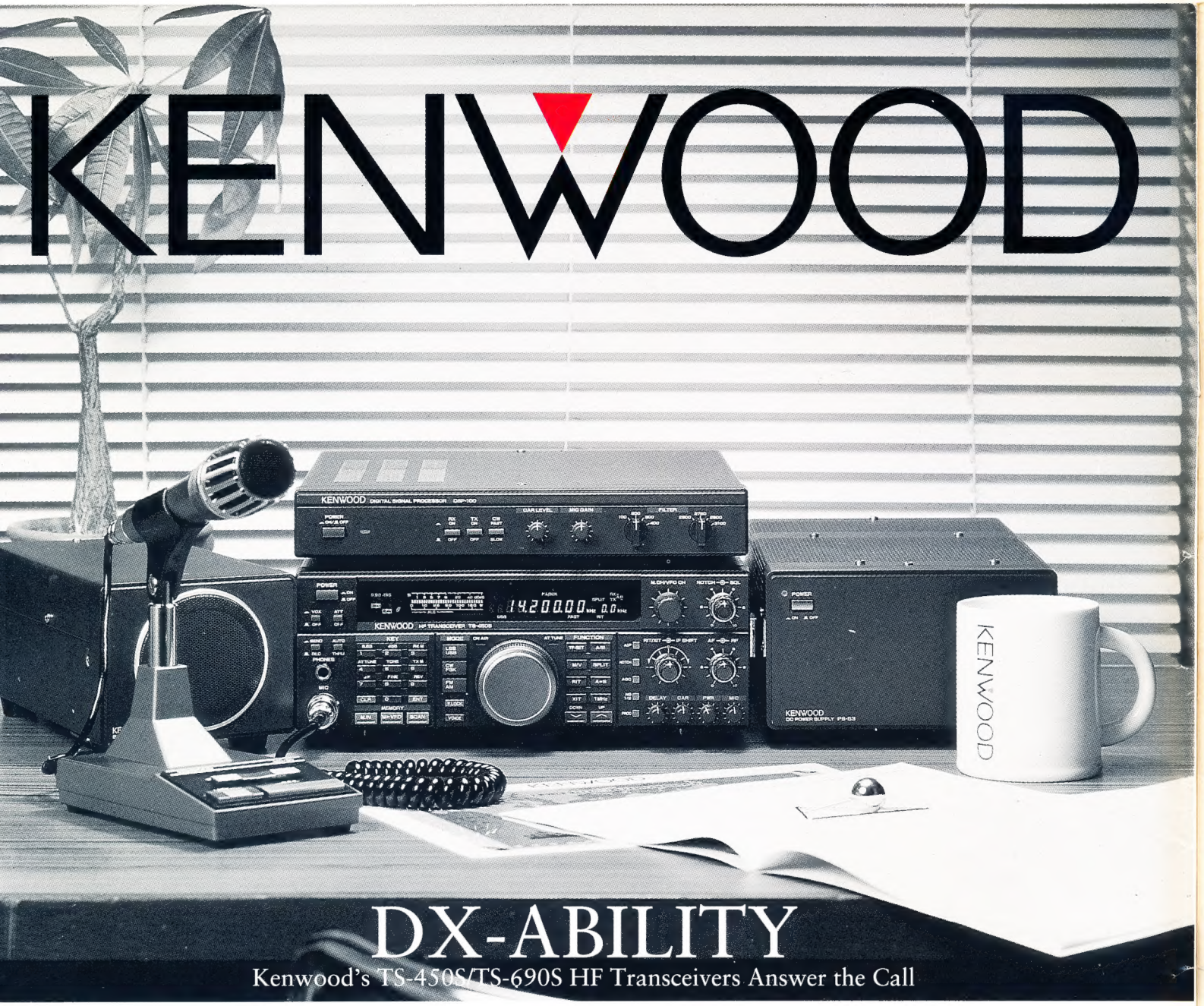
THE WIA RADIO AMATEUR'S JOURNAL



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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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Wireless Institute of Australia 1991

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EDITOR'S COMMENT

Bill Rice VK3ABP Executive Editor

Practical Democracy

The meaning of "democracy" is clear from the two Greek words which it combines: "*demos*" - "people", and "*kratia*" - "authority" or "rule". But to allow the people to exercise their ruling power requires some kind of system, and here we have scope for many variations. Virtually all of the world's governments claim to be democratic, but the efficiency of their "people power" varies greatly. Perhaps we saw the most direct form in Red Square only a few weeks ago, with something like 100,000 people not only opposing the tanks, but eventually turning them back.

More commonly, the people nominate, or elect, or at least approve, someone to represent them in some kind of discussion or planning forum. Approval, either of the person or his or her actions, is presumed if there are few or no complaints. "No news is good news". But, if a number of people see fit to complain about their representatives, then perhaps the actions which produced the complaints are in need of review.

However, there is an important factor in this feedback process from people to representatives. This is that very little in politics is either simple or obvious. As life becomes more complex, the newly elected delegate will be faced with a bewildering mass of information, and be unable to make any useful contribution until the whole mass is absorbed and understood. And simply by virtue of its volume, even if not compounded by complexity and/or shrouded in secrecy, the information cannot be known in detail by the persons in the street. Most of them don't want to know, anyway!

This produces the practical result that an opposition party may claim philosophies quite different from those of the government. But, when the pendulum swings in its favour and it becomes the government, its policies may differ very little in practice. Actions are determined by the realities of the situation less than by who has to take the action.

The WIA displays in miniature all these features of democratic politics (except for parties). The members elect people to be their Divisional Councillors. Each Council elects one of its number to be Divisional President. The Councils nominate people to be their Federal Councillors (one per Division). The Federal Council nominates people to an Executive which carries on business between Council meetings. The Executive nominates, and the Council elects, one of their number to be Federal President.

All of these people have to develop policies and make decisions on behalf of the members, and often on behalf of all Australian radio amateurs. Sometimes these policies or decisions may be unpopular, but be assured they are based on a better knowledge of all the facts than the average member can possibly have. That may sound like "Father Knows Best"! If you feel strongly that you know better, you are welcome to put your views forward. Better still, why not volunteer for Council or Executive? There are vacant seats on Executive as well as some Councils, and many presently sitting would love to be able to retire!

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Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union

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Intruder Watch:	Gordon Loveday	VK4KAL			

WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

Who Do I Contact?

A question facing many WIA members, *"Who do I contact with my problem"*, has been around for a long time. Nor is it new to our sister societies overseas.

The WIA is also approaching the stage where we too will be able to publish our directory in Amateur Radio magazine. This has come about after much hard work behind the scenes by members of the Executive. You will recall in late 1988 the WIA conducted a members survey using an insert in Amateur Radio magazine. After analysing the results of the survey we had a better picture of what services you, the members, wanted out of the WIA. The follow-on from that survey was to determine just what was being done for members and where it was being done. The *"who does what for whom and where is it done"* activity.

These actions led to a Federal council resolution being adopted last February. That resolution recognised the balance of provision of members services across Executive Office and the Divisions. It spelled them out in some detail and the Executive Office list became the agreed services list for office staffing and funding. Unfortunately there were more desirable services than the WIA could fund, so the list was produced in priority order. This means the General Manager, when drafting the WIA's budget proposals each year, has to advise Executive which activities are likely to roll off the bottom.

The Divisions did not get off lightly either, for their Federal Councillors agreed on a guideline list of Divisional services each would aim to provide. For a wise Division this provides a very good indication of where funds are required and permits budgeting for following years. We must not neglect the third list, a list of desirable services that need further investigation and costing to test their viability.

So you might ask how does this affect me, a member residing out there somewhere in Australia. Well, many of the practices that have grown up over past years have now been formalised. Executive Office knows what is expected of it and so do the Divisions. There is nothing like working to clear directions which are known to all.

So that is where the WIA Directory comes in. The members need to know where to go or who to call for a particular members' service.

The WIA Directory will appear shortly in Amateur Radio magazine. We will attempt to get it all on one page and we will try to keep it up to date and reprint it a couple of times a year. In exchange we ask

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN	3.570 MHz 2m ch 6950 Rebroadcast Mondays 8pm 70cm ch 8525 2000 hrs Sun	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Bob Lloyd-Jones Bob Taylor Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2YEL VK2AOE	From VK2WI at 1045 and 1915 on Sunday on the following frequencies and modes: (*1045 only): 1.845 AM; 3.595 AM morning and SSB evening; 7.146 AM*; 10.125 SSB; On relay 14.160 SSB* and 21.170 SSB; 28.320 SSB; 52.120 SSB; 52.525 FM; 144.120 SSB; 147.000 FM; 438.525 FM; On relay 584.750 ATV sound; 1281.750 FM. Plus automatic relays to 2m repeaters surrounding Sydney and manual to several country repeaters. News headlines by phone (02) 552 5188.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0830-1530 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Bob Lees Eric Fittock	VK4QA VK4ER VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hedland - Thomas	VK6LZ VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 146.700 at 1900 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

you to consult it before reaching for the phone, or popping that letter in the box.

Please direct your inquiries to the contact shown in the WIA Directory. Your query will be processed quicker, less effort will be needed to redirect it, and everyone will win!

Examinations Update

WIA Exam Service is now accepting applications for accreditation from persons wishing to become accredited examiners under the new amateur examinations system. Existing examiners should be aware that materials which have been accredited by DoTC, but not used, can still be used by them up until 31st December 1991. However, after that time, the only source of examinations will be **WIA Exam Service**.

While endeavouring to provide as wide a service as possible to allow access to examinations by all candidates, whatever their geographic location in Australia or its territories, the WIA does not wish to over extend the goodwill of the amateur community by over-supply of examinations. In most areas, two or three accredited examiners will be able to supply the needs of all applicants. Clubs as such cannot be accredited, but may nominate members for accreditation, and provide additional supervisors if the number of candidates is too high for the two accredited examiners.

T-Shirt Badges

The South Australian Division of the WIA has recently produced a WIA logo, similar to the Car Badge logo, suitable for applying to T-shirts or skivvies by an iron-on process. It comes with full instructions for application. The Division quotes prices as $2.00 each, plus a stamped addressed envelope, for up to 9 badges. Ten or more badges are post free. Individuals, Clubs or Divisions are welcome to order.

AMSAT-NA Technical Symposium

Papers are invited for the 1991 AMSAT Technical Symposium sponsored by the Radio Amateur Satellite Corporation-North America to be held on the 9-10th November in Los Angeles.

On the 8th November, at the same locality, there will be a joint AMSAT/ARRL Educational Workshop with the theme *"Uses of Amateur Radio Satellites in Education"*.

Papers for both are due by 1st October. Further information from Lori Weinberg at ARRL Headquarters, telephone 1 203 666 1541 or fax 1 203 665 7531.

DoTC Amateur Station Statistics

The recent release of the 30th June 1991 quarterly statistics of licensed amateur radio stations caused some confusion in the Executive Office when it was noted that the total number of licensed amateurs in each state, and in total, was significantly less than the corresponding total for the March 1991 statistics.

Telephone calls to DoTC eventually established that a clean up of the their database had occurred which eliminated a considerable number of call signs which had been reserved but not issued. This means that the June statistics should be the most accurate so far received from DoTC. According to these figures, the total number of amateur stations, including repeaters and beacons, in Australia is 18,938, of whom 10,855 hold an unrestricted licence.

EMI Standards

The August issue of *"The Australian Standard"*, the journal of Standards Australia, has a lead article on the history and present status of electro-magnetic interference controls. It separates the general problem of electro-magnetic compatibility into the two fields of emission (limitation of level of interference caused) and immunity (ability to perform satisfactorily in the presence of an agreed level of interference).

Although many countries have, over the years, established their own separate limits for EMC, they have recently realised the advantages of having internationally accepted standards. The European Commission has decreed that as from January 1992, EC and European Free Trade Association countries shall have mandatory EMC requirements for all electrical products marketed in their area. The standards are based on those prepared by CISPR.

USA limits also appear to be falling into line with the CISPR standards.

In Australia, independent testing for EMI may be certified by AUSTEL, but the acceptability of these tests by the EC is yet to be proved. DoTC is considering making EMI compliance mandatory in Australia. Compliance is already mandatory for equipment connected to telecommunications networks. Australia is a member of each CISPR Committee, and has adopted the CISPR EMI standards as national standards. So, it looks as though we may eventually have some official relief from some of our interference problems.

1992 Call Book Available

The new **1992 Australian Radio Amateur Call Book** is now available for you to purchase. Production of the Call book entailed considerable time and effort on the part of the Executive Office staff at the same time as they were heavily involved in preparation for the new amateur examinations system.

This year's edition should be the most accurate yet produced. All the entries have been proofread, and the information from DoTC matched to that on the WIA membership records.

Special thanks go to the VK2 and VK6 volunteers who proofed their Divisional lists, as well as those members of the Publications Committee who gave an evening of assistance.

The 1992 Call Book lists nearly 19,000 individual call signs as well as SWLs, the usual reference information of repeater lists, beacons, band plans and DXCC countries, etc.. We are sure all members will want a new edition as soon as they see it. Look for it at your Divisional Bookshops, but do not wait too long as already the orders are rolling in. At the time of preparing this news item, over two thirds of the print run of the Call Book had already been presold.

If you can't beat 'em, join 'em...

The Executive Office is proud to announce that another staff member has joined the ranks of licensed amateurs. Chris Russell, who has worked part time as a clerical assistant in the office since December 1989, decided early this year that she needed to know more about the *"product"* of the organisation for whom she worked.

Although Chris knew virtually nothing about amateur radio, and admits that she had no conception of components or principles, she joined the Victorian Division classes shortly after they began in February. As time passed some other class members fell by the wayside, but Chris kept struggling on and passed the Regulations exam in May.

By sheer hard work (and with the tolerance of other office staff beleaguered by her many questions) Chris prepared for the Novice Theory and 5 wpm CW examinations, which she passed in August at her first attempt. Well done, Chris. Now there are only three part-timers for us to urge towards that piece of paper.

Executive Office Upgrade

After nearly 12 years at the present venue, the WIA was finding both work space and storage facilities in the Executive Office inadequate for efficient functioning. A survey of other possible accommodation quickly showed that, although plenty of office space was available at competitive rates, the location and facilities of the present site could not be bettered.

The end result is that the Executive Office is remaining at its present location. We have been able to extend the existing space by including a small adjoining room. With a coat of paint and some reorganising of the furniture, the office is now far more comfortable and efficient and will be able to accommodate the quarterly meetings of Executive and Federal Councillors without the scene resembling the proverbial *"sardines in a can"*.

Sincere thanks are due to those members who gave considerable time and effort to moving furniture, magazines, stationery, etc.. Reg Southwood VK3CCE, in particular, deserves our thanks for many hours of valuable assistance.

Computers Again

At last all the trauma and stress of the change-over of the Executive Office computers to a network is past and the network is finally fully functional. It took nearly four months before the last *"bugs"* were fixed. Those of you who have been through the experience of setting up a network where each computer is a different brand and configuration know what we have been through.

The network has stood up to the hard work of preparing for the Call Book and the examinations without any hiccups. Although there were times when we could cheerfully have gone back to the original stand-alone system, it must be admitted that the functioning network has increased office efficiency and reduced the work load on the staff.

In addition, it allows us to respond to members' queries more promptly as data will not be tied up when, for example, the membership computer is generating labels or statistics.

Off to Bandung

In early October, the WIA delegation to the IARU Region III Conference in Bandung will set forth for a few days of intense discussion and negotiations. Unfortunately, at this late stage one of the appointed delegates, George Brzostowski VK1GB, has had to withdraw because of other commitments.

The WIA is most grateful to Kevin Olds VK1OK, who has stepped in to ensure that the delegation is fully staffed. As many sessions are conducted concurrently, it is of vital importance that our delegation be large enough to cover all the interest areas.

JOTA

Once again it is almost time for JOTA. This is the time of the year when temporary masts and wires spring up above Scout and Guide halls and camps, so that young people can enjoy perhaps their first experience of talking *"on air"* to an unseen fellow scouter or guider.

Many of our present members became interested in amateur radio after participating in a Jamboree Of The Air and, although the present generation is more experienced in radios than was the case previously, there is still much for amateur radio to offer.

This is an ideal chance to show what amateur radio can do, and a chance for many members to put something back into the hobby. Even if you do not participate at a JOTA station, please be aware that the event is on, and cooperate with the JOTA stations by being patient and helpful with the youngsters if they wish to talk to you or if they happen to be tying up your favourite frequency.

Gladesville - AUSSAT Test

The fourth test in the Gladesville - AUSSAT series was scheduled for transmission on Wednesday 25th September. The major theme was to be AUSSAT itself. The test was expected to be on the usual transponder with a south-east beam and a spot towards Perth.

AUSSAT and JOTA

A feature of recent Jamborees of the Air in Australia has been the linking of repeater networks through the communications satellite, AUSSAT. Permission has been given again this year to AUSSAT by DoTC for the provision of up and down links by AUSSAT during the JOTA on the weekend of 19 - 20th October 1991.

70th Anniversary

A circular from the Finnish Amateur Radio League, which arrived by fax only at the beginning of September, announces that SARL is celebrating its 70th Anniversary in September 1991.

Unfortunately this information arrived too late for all our members to be notified of the use of the special prefix "OF" instead of the normal "OH" during the month of September, but now you know what it was all about.

A special SARL 70 Award has been published to commemorate the anniversary. More details are available from SRAL Headquarters, PO Box 44, SF-00441 Helsinki, Finland.

ARRL Books

Recent publications announced as available by the ARRL, a prolific publisher of amateur radio books, include the *Proceedings of the ARRL National Education Workshop*, and the *International Amateur Radio Study Guide*. These new books should be available shortly from the WIA Divisional Bookshops.

50 MHz Beacons

A note from John Martin VK3ZJC, the chairman of the WIA Federal Technical Advisory Committee, points out that only one response has been received so far to the proposal for 50 MHz beacons in the eastern states of Australia.

As a decision about this important question is to be made at the October meeting of the WIA Federal Council, time is running short for input from the users of the 6 metre band. The proposal, briefly, is to allot extra frequencies in the DX window, giving preference to frequencies between 50.053 and 50.063 MHz. The number of channels available is strictly limited and it is proposed at this stage to limit 50 MHz beacons to one each in VK3 and VK7, and two each in VK1/2 and VK4.

This means that six channels will be earmarked. One of these is already in use by VK3SIX, and a second has been earmarked for a beacon in the Hobart area which should begin trial operations shortly.

If there are any objections to this proposal, please write immediately to John Martin at PO Box 300, Caulfield South, 3162. There is no point in waiting until the decision is made and then complaining about it.

New VHF Records

John Martin VK3ZJC, chairman of FTAC, has advised of five new 6 metre records, three of which are long path contacts which were not usually recognised in the past.

Congratulations are due to the following:
NATIONAL RECORD:
VK3OT to 9Q5EE on 06/04/91 27186 km
VK1 RECORD: VK1RX to KP4A on 08/04/91 16082 km
VK2 RECORD: VK2BBR to 6W1QC on 02/03/91 21384 km
VK4 RECORD: VK4ZAZ to 6W1QC on 02/03/91 21741 km
MOBILE RECORD:
VK4ZAZ/M to FM5WD on 06/04/91 16243 km.

1991 VK-ZL-Oceania Contest

Members are reminded that the 1991 VK-ZL-Oceania contest is to be held on the first two weekends in October. The SSB contest runs from 1000 hours UTC on 5th October to 1000 hours on 6th October, and the CW section runs during the same times on 12 - 13th October.

Full rules were published in the July 1991 issue of Amateur Radio magazine, but note that the start and finish times are as given above.

Remember also that the ALARA contest takes place next month, and that log summaries for the 1991 Remembrance Day contest must reach the Contest manager by 4th October this year.

Buyer Beware

Advertising literature and sales pitches are widely known to need careful interpretation in some cases. An instance of this in the field of amateur radio has been brought to the attention of the WIA regarding the differences in radio equipment produced for different markets.

Those who purchase a "bargain" either overseas or locally may find that the set is not appropriate for the Australian scene, leading to expensive and possibly illegal modifications, or else may be liable for full customs duty.

Sets which have been brought into the country and modified here in an attempt to equal those designed for Australia are liable to still be inferior even after modification. There will probably also be warranty and repair problems.

As the WIA has stated previously, the safest and cheapest procedure is to buy in Australia from the reputable authorised agents for each brand name.

Albania Prepares for Amateur Radio

Amateurs around the world are preparing to welcome Albania to the amateur radio community. The ARRL newsletter of 24th August 1991 reports on the announcement in Tokyo by the Secretary General of the Albanian Department of Posts and Telecommunications that amateur radio will return to Albania in September.

An international group of amateurs, representing a number of national societies, will spend four weeks in Albania to assist with training the local enthusiasts in both radio theory and operating techniques. Yaesu has donated some equipment in preparation for the start of on-air operating, probably after 14 - 15th September. No call signs have yet been announced, but SSB and CW operation on the 20, 15 and 10 metre bands has been suggested.

Russia Establishes Amateur Radio Emergency Service

The same ARRL newsletter notes discussions and informal agreements between the ARRL and amateurs in the Russian Republic of the USSR on the use and potential of amateur radio in emergency situations.

The newly formed RARES is associated with Red Cross and Red Crescent. Joint conferences between RARES and ARRL, and mutual participation in exercises and relief operations, are in the plans.

Camp Quality On Air

A call from VK5 advised that Charles VK5CQ will be setting up a station at the South Australian Camp Quality site from 30th September to 4th October. We understand that there will be several of these camps throughout Australia at that time, and the question is "*Are any other camps planning to have an amateur station and, if so, can contacts be arranged?*"

If members have information on this, or can offer assistance, would they please contact Charles Waite VK5CQ, by telephoning his pager service on 016 88 9105 and leaving a contact number or suggesting a time and frequency, or else via the VK5 2 metre Bulletin board.

Magazine Identity

The *Over to You* columns in Amateur Radio magazine of late have contained a number of letters discussing the possibility of amalgamation between Amateur Radio magazine and other magazines catering to a similar market niche.

A responsibility of WIA management is continually to examine all possible options for improving service to members, and reducing the costs of providing those services. In recent years the WIA has prepared several detailed analyses of the possible benefits and costs of amalgamation or integration of our magazine with other publications, and has decided each time that the disadvantages far outweigh the benefits.

An independent Amateur Radio magazine is seen by the majority of members as an essential forum to enable them to air their views, publish technical articles, report on radio activities and keep in touch with the status of amateur radio related affairs throughout the world.

It is a tribute to the standing of Amateur Radio magazine, and essential for the future of the WIA, that members feel free to question policy and offer constructive criticism.

We assure them that the management of the WIA is prepared to receive and consider any suggestions which may benefit members.

Examination Costing

One of the hardest tasks associated with the establishment of the new **WIA Exam Service** has been the determining of the fees to be charged for the examinations. Under the devolved system no fees were set by DoTC, in the belief that market forces would operate.

When the **WIA Exam Service** begins as from 1st October, accredited examiners will purchase examination materials from **WIA Exam Service** at set prices, but will be free to make an additional charge to candidates for their services if they so desire to cover their operating costs.

Without a clear figure of the likely demand for examination materials, projections have had to be made on estimates based on a variety of sources of information. In setting their fees **WIA Exam Service** has been very conscious that the WIA membership should not subsidise the exams from their membership fees, and at the same time exam candidates should not subsidise WIA membership fees.

WIA Exam Service is very pleased to announce that the costs to accredited examiners for individual sections, or subjects, of the examinations have been kept to a lower level than first anticipated.

Quarterly Federal Council Meeting

The weekend of 26 - 27th October will be the occasion for another meeting of the complete Executive and Federal Council of the WIA.

A number of items are already on the agenda, including the repeater and beacon planning and discussion on further deregulation of the Amateur Service.

DoTC has suggested that there are a number of areas in which amateurs should be able to manage their own affairs. A committee is currently considering this, and will report at the October meeting.

Members who wish to have input should contact their Divisional Federal Councillors. The October quarterly meeting will also spend time on the budget, and membership fees, for 1992.

International Representation Fund Donations

Since our last acknowledgment donations to this important fighting fund have been received from the following:

B Dunkley VK3EWD
G Jenkinson VK3BBK
F Edgar Nicholls VK7RY
Moorabbin and District Amateur Radio Club
Canberra Radio Society.

The WIA has thanked these contributors individually. This acknowledgment is a public record of the WIA's appreciation.

Inquiry into Radio Frequency Spectrum Management

In June 1990 the House of Representatives Standing Committee on Transport, Communications and Infrastructure began an inquiry into the management of the radio frequency spectrum. Since then five public hearings have been held and 39 submissions received.

In June 1991 a discussion paper was circulated asking for responses to specific questions which had emerged.

The WIA sent a submission last year, and responded to the discussion paper in due course, emphasising the value to the community of frequency allocations which are not sold to the highest bidder, but are maintained as the "National Parks" for recreation and community service.

The WIA is continuing to monitor the progress of this inquiry.

Divisional Bookshops

Each month's issue of the WIA's own magazine, Amateur Radio, carries an advertisement for books and other items available from the Divisional Bookshops.

Members are asked to note that these items are not available from the Executive Office, but only from your Division.

If orders are received at the Executive Office they must be forwarded to the appropriate Division.

This of course delays the fulfilment of the order.

If there are items you would like to be made available, or books which you have found that you think should be on the list, please approach your Division with your suggestion.

Would you like to be able to buy mugs, spoons, coasters, glasses, etc. with the WIA logo on them? Talk to your Division.

ar

TECHNICAL CORRESPONDENCE

Old Time Art

I was recently looking for some information on the Bellini-Tosi Direction Finder, so went to the Admiralty Handbook and, in browsing, came across the information shown below.

The procedure is so far removed from the actions and knowledge of our present-day amateurs, I thought it may deserve a place in *AR*, if only to show those AMTOR/packet people what they have missed!!

Only 60 years ago and this book was the state of the art.

ROD TORRINGTON VK3TJ
4 THISTLE ST
PASCOE VALE SOUTH 3044

From page 880 of *The Admiralty Handbook of Wireless Telegraphy 1931*

832. **Practical Points in Tuning Spark Primaries**

The following special precautions should be observed in tuning the primaries of spark transmitting circuits:

(a) Use a coupling between wavemeter mutual and primary which gives a maximum of about half the scale reading of the galvanometer.

(b) Sparking must be steady and even. The key should be pressed so as to give evenly spaced "shorts". A continuous "long" should not be made, as the gap will get very hot and the plugs be burned away.

(c) The plugs should be clean and not pitted.

(d) In sets where a rotary gap is fitted this should be kept running.

(e) Great care must be taken in adjusting a fixed gap and suiting the AC voltage to it. If the gap is too short for the supply voltage, "arcing" will occur, ie current from the transformer will flow across the gap without charging the condenser. If too long, a combination of "one spark per cycle" and "one spark per half cycle" may be produced, with resultant uneven sparking voltage.

(f) Sparking in a wavemeter condenser should not be allowed. This can generally be obviated by loosening the coupling to the oscillatory circuit.

(g) The mutual coil of the aerial circuit should be disconnected.

Pre-Selector

It is worth noting that Drew Diamond's Converter, *AR* June '91, can be modified into a handy pre-selector. Switch off the oscillator, disconnect the output tuned circuit and replace it with a toroid wound for a 3:1 reduction ratio. Terminate the low side in a 3dB 50ohm T pad for RF stage stability if the Rx is disconnected, and as the source impedance for the receiver input. This is not a high-gain set-up; there is no point in encouraging overloading! The objective is a maximum rejection of unwanted signals and to prevent the generation of spurious ones through inter-modulation.

ROBERT R MCGREGOR
VK3XZ
2 WILTSHIRE DRIVE
SOMERVILLE 3912

Tuning Refinements

It was great to see and read the resurrection by Rod VK3TJ of a true basis for antenna tuning, one that can match the diversity of input conditions that occur at the end of an antenna. Here are a few additions that will not change the circuit but improve its versatility.

Tapped coils can be difficult, electrically, when only a few turns are used. Solution: wind another smaller, one quarter to one fifth inductance, also tapped. This allows a finer adjustment, but importantly, when only a small inductance is required, the larger one can be shorted out. Place the coil axes at right angles for zero coupling. Another tip from the past.

If two gang bc condensers are used the frames are, of course, insulated from earth. Then it is often convenient to connect between the two stator terminals for half C and twice the voltage rating, can be handy at C2 in some situations. Likewise, the ability to parallel the two sections can be handy at C1.

I like four inches (100mm) of insulated rod to the tuning knob, reduces RF burns and hand capacity, hi.

ROBERT R MCGREGOR
VK3XZ
2 WILTSHIRE DRIVE
SOMERVILLE 3912

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The Luxembourg Effect - An Ionospheric Funny

ANDREW WOOLF VK2EPO
14 DENNIS ST
GREYSTANES 2145

Are you located in the vicinity of a high-powered medium frequency broadcasting transmitter? Can you produce a strong signal on 160 or 80m CW? Then read on about how you may be able to observe an unusual radio propagation effect first reported more than 50 years ago.

1. Introduction

AS ANY AMATEUR WHO has used the HF bands will know, the ionosphere is a strange creature, at times well behaved and predictable, at other times violent and unco-operative. In attempting to understand the workings of the ionosphere, researchers have discovered many unexpected phenomena. The very broad field of nonlinear ionospheric physics is one area which is responsible for a number of such phenomena, and in which a lot of research is currently being pursued. One particular aspect, however, that has been known since the 1930s, is now well understood and may be of interest to other radio amateurs. "Nonlinear two-wave interaction", or "ionospheric cross-modulation" was first reported by Tellegen[1] in the international scientific journal *Nature,* in 1933. Located at Eindhoven, Holland, he noticed that if he tuned his radio receiver to Beromünster (460m), he often heard background modulation from the new high-powered broadcast station at Luxembourg (1190m). He eliminated the possibility of cross-modulation in his receiver, as well as disturbances from his town's electrical distribution system. He also noted the fact that Luxembourg is situated almost on the line directly joining Beromünster and Eindhoven (see Fig 1). Following this initial observation, he found that the Luxembourg modulation could also be heard with a number of other broadcast stations, all lying somewhat in the direction from Eindhoven to Luxembourg, but farther away than Luxembourg. His conclusion was that the phenomenon had its origin somewhere in the transmission between these stations and Eindhoven.

Evidence mounted that the "Luxembourg effect", as it became known, was due to a nonlinear effect in the ionosphere, and in 1934 Bailey and Martyn suggested[2,3] that this nonlinearity occurred in the process of absorption of the waves. The quantitative theory they developed explained the observations very well. Over the next several years, detailed investigations were made[7-13], both theoretical and experimental, and since the Second World War the phenomenon has been understood well enough to be used as a tool for investigation of the ionosphere. It is worthwhile noting here that, as with many other areas of ionospheric physics, Australian researchers figured prominently in the study of the effect. Bailey and Martyn were both Australian, as were several other key researchers in the field, notably Huxley, Hibberd, Pawsey etc. The WIA was even mentioned in at least one paper[4].

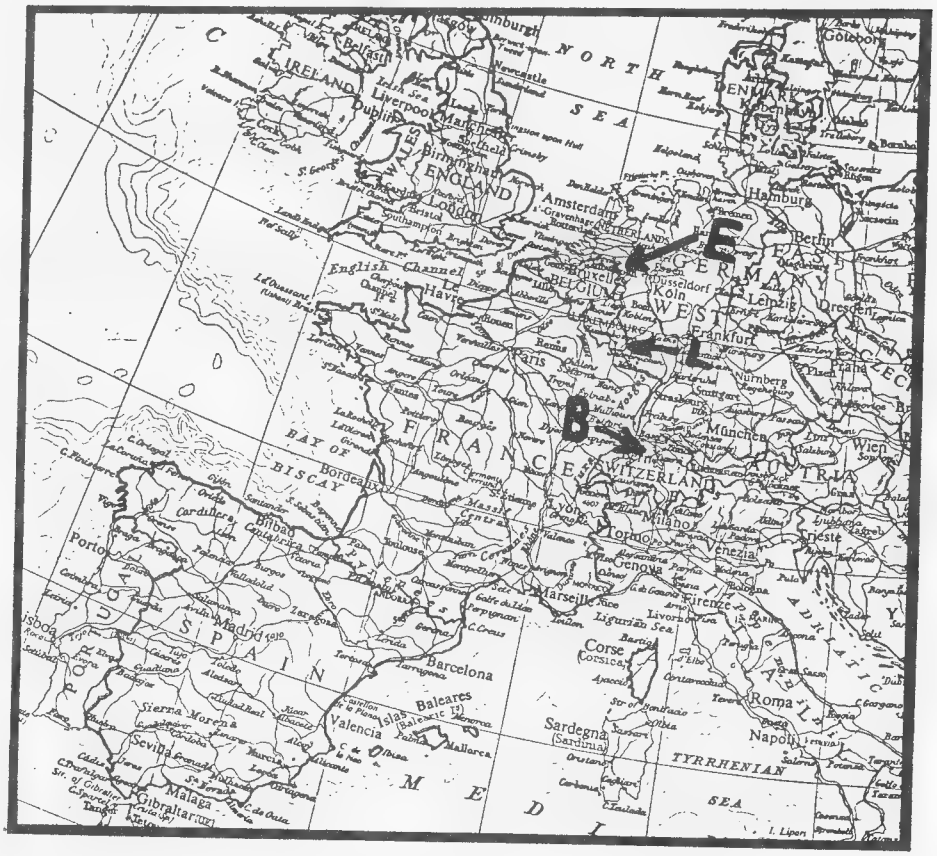

Figure 1: Location of Tellegen's initial observation

The rest of this article is organised as follows: Section 2 reviews some important concepts from ionospheric physics in this context; Section 3 contains a descriptive physical explanation of ionospheric cross-modulation; and Section 4 describes one of the ways the phenomenon has been used as a tool in ionospheric investigation. Section 3 also discusses the possibility of amateur observation of ionospheric cross-modulation.

2. Ionospheric Physics Revisited

It will be recalled that the ionosphere is "... that part of [the atmosphere[where ions and electrons are present in quantities sufficient to affect the propagation of radio waves"[5].

This ionisation occurs through the action of the sun's radiation on the various gas molecules present. The degree of ionisation depends on a number of factors, including the density of gas particles, the

temperature of the particles, intensity of the solar radiation etc. The ionisation is characterised by an *electron density profile, N(h),* which gives the electron density N as a function of height h. Fig 2 shows some idealised profiles. As can be seen, N increases with height up to about 300km. The appearance of peaks in these profiles gives rise to the usual classification of the ionosphere into the *D region* (from heights 40km to 90km), the *E region* (90km to 160km) and the *F region* (>160km).

Another parameter that is important in ionospheric physics is the *electron collision frequency, v.* This is the average rate at which free electrons collide with heavy particles (ions, molecules). This collision frequency also depends on height, but, unlike electron density, it decreases with increasing altitude. Fig 3 shows a typical electron collision frequency profile. The decrease in collision frequency with height is as one would expect, since the atmosphere becomes more rarefied at height, and so particles have fewer collisions in general.

An effect which amateurs will be familiar with (particularly if their antennas are as lousy as mine!) is the absorption of waves by the ionosphere. Some quite extensive mathematical equations describing absorption have been derived, and are beyond the scope of this article. Suffice to say that ionospheric absorption is measured by an *absorption coefficient, k,* which is essentially proportional to the electron density and the collision frequency at a particular wave frequency and height, ie

$$k \propto Nv.$$

A bit of thought shows why absorption mostly occurs in the lower regions of the ionosphere. As mentioned above, N increases with height and v decreases with height. However, v decreases faster than N increases. The product Nv, then, has a maximum which, as it turns out, occurs in the D region or lower E region.

One further concept that is needed from ionospheric physics in order to understand ionospheric cross-modulation is the idea of electron temperature. We think of the temperature of a gas as being a measure of the average kinetic energy of the particles. The faster the particles are moving, the higher the gas's temperature. So, too, with electrons in the ionosphere. We can talk about the *electron temperature,* T_e, keeping in mind that this refers in some sense to the rms speed of the electrons. The electron temperature and collision frequency are related as follows:

$$v \propto \sqrt{T_e}$$

(for collisions with molecules - the dominant case).

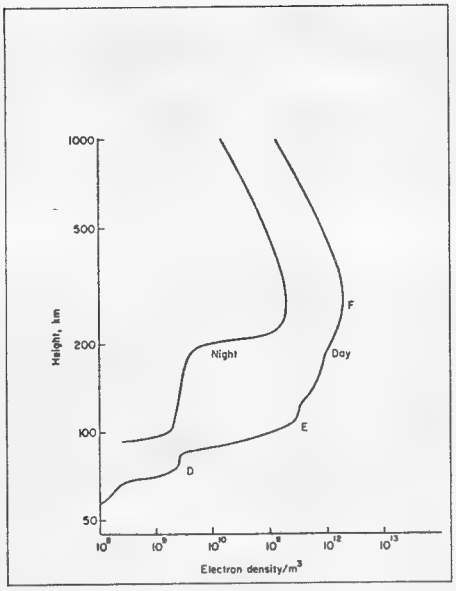

Figure 2: Idealised electron density profiles (from [16])

To summarise this section, one need only remember that radio waves are absorbed as they traverse the ionosphere, and that absorption at a particular height and wave frequency is proportional to both the electron density and the collision frequency at that height. Also, the collision frequency is proportional to the square root of the electron temperature.

3. Ionospheric Cross-Modulation

It is conventional in any discussion of ionospheric cross-modulation to speak of the "wanted wave" and the "disturbing wave". Ionospheric cross-modulation, as with receiver cross-modulation, results in the transfer of modulation from the disturbing wave to the wanted wave. In the ionospheric case, this transfer of modulation occurs as both waves pass through the same region of the ionosphere, called the "region of cross-modulation". This terminology is illustrated

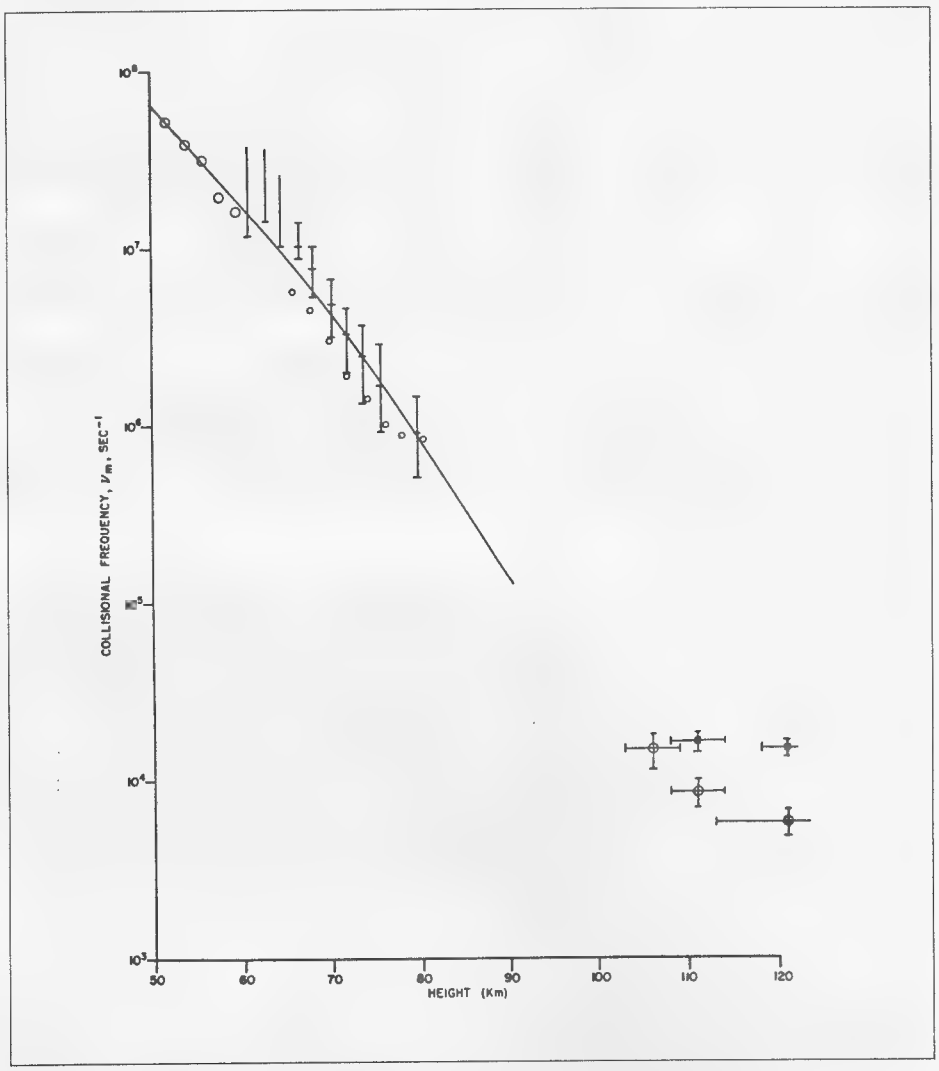

Figure 3: Electron collision frequency profile (from [15].

diagrammatically in Fig 4.

From the previous section, we know that the absorption of a wave in the ionosphere is proportional to the electron collision frequency which, in turn, is proportional to the square root of electron temperature. Suppose that the electron temperature was changed somehow. This would then change the collision frequency and the absorption coefficient; an increase in electron temperature would increase the absorption, a decrease in T_e would decrease the absorption. The strength of a wave passing through this region would decrease or increase, respectively. Now consider what would happen if a very strong RF wave could "heat" the electrons. The above argument shows that turning such a wave on would increase ionospheric absorption in the region it heats. The strength of another wave passing through the same region would be reduced. If the strong heating wave (the disturbing wave) was amplitude modulated, the electron temperature would become modulated, causing the collision frequency and absorption coefficient to become modulated. Another wave passing through the region (the wanted wave) would then also become amplitude modulated because of the varying absorption. This is the essence of ionospheric cross-modulation. It can be shown that the heating effect of a wave is given by the following equation:

$$\Delta T_e = \frac{e^2 E_0^2}{3mk\delta(\nu_0^2 + \omega^2)}$$

where

ΔT_e = increase in electron temperature, K,
e = charge on electron, $1.6 \times 10^{-19} C$
E_0 = amplitude of disturbing wave, V/m,
m = mass of electron, $9.1 \times 10^{-31} kg$,
k = Boltzmann's constant, $1.38 \times 10^{-23} J/K$,
δ = fraction of electron's energy lost in a collision, = 2×10^{-3}
ν_0 = undisturbed electron collision frequency,
w = $2\pi f$= angular frequency of disturbing wave, rad/s.

Table 1 lists some typical percentage increases in electron temperature for several locations in the ionosphere and several powers and frequencies of disturbing waves. From this we can see that only very high powered, medium frequency waves can significantly affect the electron temperature.

Mathematical expressions can be derived for the actual depth of cross-modulation produced on the wanted wave. It turns out that cross-modulation is produced at the modulating frequency and twice the modulating frequency of the disturbing wave, although the latter is much weaker. Rather than give the full equations for the cross-modulation depth, which can get rather messy, I will instead look at the dependence of the transferred modulation on various parameters.

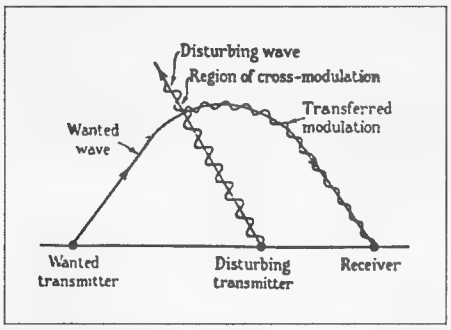

Figure 4: Nomenclature in ionospheric cross-modulation (from [14])

3.1 Dependence on Modulation Frequency

The transferred modulation obeys the following relation:

$$M \propto \frac{1}{\sqrt{(\delta\nu_0)^2 + \Omega^2}}$$

where

M = wanted wave cross-modulation depth,
δ, ν_0 = as before,
Ω = modulation frequency.

Fig 5 shows a plot of this variation. The dots on this graph show experimentally determined points. It can be seen that the theoretical curve is quite consistent with experiment. This curve also shows that the cross-modulation depth is strongest at low modulation frequencies.

3.2 Dependence on Power of Disturbing Wave

Both theory and experiment show that the depth of cross-modulation is proportional to the power of the disturbing wave.

3.3 Dependence on Modulation Depth of Disturbing Wave

Again, theory and experiment both show that the cross-modulation depth is proportional to the modulation depth of the disturbing wave.

3.4 Dependence on Frequency of Disturbing Wave

Theory predicts the dependence on disturbing wave frequency to be given by:

$$M \propto \frac{1}{\omega^2 + \nu_0^2}$$

This seems to have been borne out in practice. It is clear that cross-modulation will be more pronounced the lower the frequency of the disturbing transmitter. This is in accordance with the observation earlier that the lower the frequency of the transmitter, the better it is at heating the electrons in the ionosphere.

3.5 Dependence on Frequency of Wanted Wave

Since cross-modulation is due to nonlinear absorption, the effect will be strongest when both waves are absorbed most strongly in the same region of the ionosphere. This implies that cross-modulation will be most noticeable if the wanted wave is reflected from the lower regions of the ionosphere, ie if it is fairly low in frequency.

3.6 Dependence on Earth's Magnetic Field

The fact that the earth has a magnetic field alters the results for dependence on disturbing wave frequency somewhat. The modified form of the earlier relation is:

$$M \propto \frac{1}{(\omega - \omega_p)^2 + \nu_0^2}$$

Ionosphere	Frequency (MHz)	ΔT_e (%)				
		10kw	100kw	200kw	500kw	1000kw
D layer (daytime)	< 0.48	0.2	2	4	10	20
$\nu_0 = 10^7$	1.6	0.1	1	2	5	10
$T_e = 300°K$	16	0.002	0.02	0.04	0.1	0.2
$\delta = 2 \times 10^{-3}$						
h = 60km						
Lower part of E layer (night)	< 0.03	30	140	210	360	570
$\nu_0 = 7 \times 10^5$	0.16	10	80	140	270	430
$T_e = 200°K$	0.32	4	30	60	150	270
$\delta = 2 \times 10^{-3}$	0.80	0.6	6	10	30	60
h = 90km	1.6	0.2	2	3	8	20
	16	0.002	0.02	0.03	0.08	0.2
F layer	16	0.0004	0.0004	0.0008	0.002	0.004
$\nu_0 = 10^3$						
$T_e = 2000°K$						
$\delta = 10^{-4}$						
h = 300km						

Table 1: Increases in electron temperature for different powers and heights

where w_p is the so-called gyro-frequency and depends on the local value of the earth's magnetic field. Typically, the gyro-frequency would be around 1500kHz. Theory predicts that a "resonance" would occur if the disturbing wave frequency is equal to the gyro-frequency and there is some evidence that significant increases in cross-modulation depth do occur as the disturbing wave frequency passes through the gyro-frequency[4]. However, the gyro-frequency generally varies greatly with position in the ionosphere so that this gyro-resonance is not often observed.

3.7 Amateur Observation of Ionospheric Cross-Modulation

From all the above considerations, ionospheric cross-modulation is most likely to be experienced in an amateur radio context on either 160m or 80m. The received signal would have to be mostly skywave, and there would most likely be a high powered medium frequency AM broadcast station situated about halfway between one amateur station and the other. The cross-modulation would best be observed using AM, or just transmitting a carrier wave.

4. Use of Ionospheric Cross-Modulation for Ionospheric Diagnostics

This section outlines a method due originally to Fejer[6] for using ionospheric cross-modulation to determine electron densities and collision frequencies in the lower ionosphere.

Referring to Fig 6, the experimental set-up consists of two pulsed transmitters and a receiver, all at the same site. The receiver is tuned to receive the reflected pulses from the wanted transmitter. These pulses are sent with a certain repetition rate. Now consider the disturbing transmitter. As the RF pulse from this transmitter travels upwards, it heats the ionosphere. At some point it will meet up with the reflected wanted pulse. Suppose this happens at a height h_o. Then for the rest of its trip back to the receiver, the wanted pulse will be more

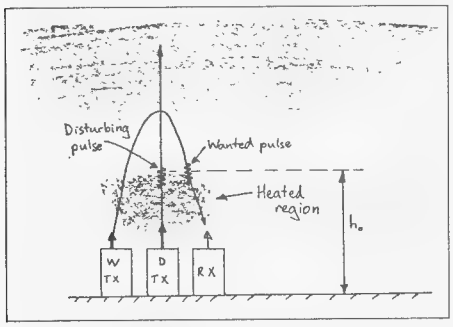

Figure 6: Fejer's experimental set-up

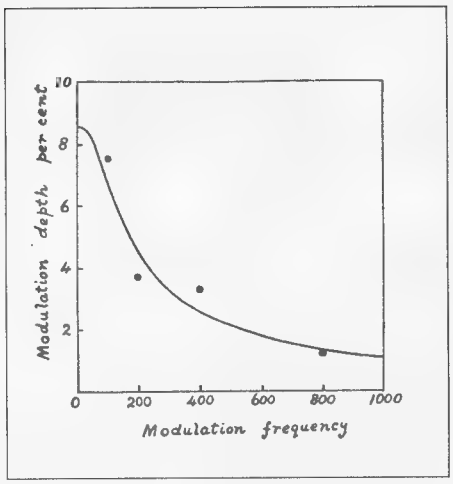

Figure 5: Variation of cross-modulation depth with modulation frequency (from [7])

strongly absorbed, since it is travelling through a heated part of the ionosphere. If the disturbing pulse is sent at a time t_0 before the arrival of the wanted pulse on the ground, then the height h_o is given by $h_o = ct_o/2$, where c is the speed of light. The repetition rate of the disturbing pulse is half of the wanted pulse, so that only every second received pulse is affected. By observing the amplitudes and phases of successive received wanted pulses, calculations can be done to find the electron density and collision frequency at height h_o. Further, by varying the time t_0 at which the disturbing pulse is transmitted, the height h_o can be varied, and so electron density profiles and collision frequency profiles can be determined. Fejer's initial results are shown in Fig 7.

5. Conclusion

The phenomenon of ionospheric cross-modulation has been described and explained. The dependence of cross-modulation depth on various parameters has been considered, and one method of using it to probe the ionosphere has been described. The possibility of amateur observation of the phenomenon has also been mentioned. Finally, I would be interested to hear from anyone who believes they have observed ionospheric cross-modulation.

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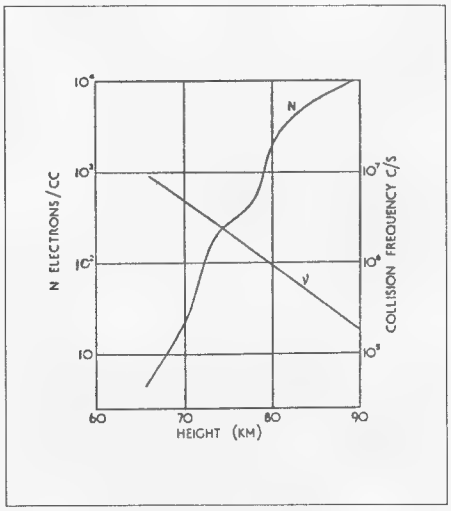


Figure 7: Fejer's results (from [6])

(The highest powered MF transmitter used in Australia is 50kW and there are 13 transmitters of this power operating, all carrying the National broadcasting service (ABC). A selection of these is: 549kHz 2CR Cumnock, 594kHz 3WV Horsham, 630kHz 4QN Townsville, 729kHz 5CL Adelaide, 774kHz 3LO Melbourne, and 558kHz 6WA Wagin. Don't forget to make allowance for the low angle of radiation from these services when looking at suitable paths for observation. Good luck! Tech Ed). **ar**

Modifications to Tiltover Mast

P Glavimans VK3BK
47 Heathmont Rd
Ringwood 3134

MODIFICATIONS CAN improve the tiltover mast described by Leigh Baker VK5WO in *AR* September 1989.

The scrap angle iron welded to part of the post which goes in the ground were welded at right angles to each other to give a better "grip" in the concrete base.

The upper mast was moved 180° and now will come down with its carriage to, and rest on, the winch mount which is welded across the whole of the steel post and protrudes about 15cm at the back of it. The guide rail has to be moved accordingly. The winch is mounted level with the rear end of this mount. This gives enough room for the upper mast carriage to go past the winch and rest on the winch mount. The guide rail needs to be extended by approximately 21cm. A piece of 25mm angle iron is bolted on the bottom mast for the carriage to rest on. This angle iron can be removed so the upper mast can be slipped off for maintenance or removal of tower.

The automatic lock-in device, see pic 1, is spring loaded at the rear and stopped from tilting down when the mast is not in a vertical position with a bolt screwed into the rear of the steel post. When the tower is brought back into vertical position, the auto locking device will fall over the shaft sticking out through the bottom mast. This shaft is 10mm round iron and is held in place with split pins. The auto locking device is hinged with a round iron shaft 10mm in diameter and held in place with split pins. The iron shaft goes right through the steel post.

The roller bearings suggested are likely to rust and were replaced by turned-down roller skate wheels with aluminium inserts and stainless steel washers on either side to keep them in place.

Also, two heavy prongs, see pic 1, were welded just underneath the winch mount at either side of the steel post. A heavy chain link was welded on one side. See pic 2. The other side of the chain was welded to the other prong.

A lock protects the tower from being tilted over by any unwelcome visitors. Also, a large chain around the carriage and winch handle was used for security

Photo 1: Automatic lock-in device

Photo 2: A view at right angles to photo 1.

reasons instead of the one seen in pic 2 using the same lock.

The next is very important. A Tee piece is inserted through the bottom mast just above the carriage and protrudes about 10cm out the other side. This device prevents the upper mast from being pulled up when tilting over the tower.

I painted the handle red. Always keep it in place! To wind the upper mast up, remove this handle.

All cables were fed through the centre of the upper mast to come out at the bottom through a 2.5cm hole. The lot was painted green to fit in with the green trees etc.

If you have $200 spare, replace the winch with a clutch-type winch for safety.

My many thanks go to Peter Webb, Technical Services Director with The Trailer Factory, Bayswater, Melbourne, for suggestions and putting it all together. Thanks also to my daughter Roseanne for letting Peter work many nights on this job.

ar

WIA Victorian Division is Moving Office

The Victorian Division Office will be moving to 40G Victory Boulevard, Ashburton 3147 in mid-October.

The new office will be located in premises the Division purchased in June this year.

Hours of business remain unchanged — 8.30am to 3.30pm on Tuesday and Thursday.

The telephone number is unchanged, 885 9261, and the fax number 885 9298.

During the move the office will be closed for all business on 15 and 17 October and will reopen on 22 October.

The Unipole Antenna for Two Metres

DES GREENHAM VK3CO
16 CLYDESDALE CRT
MOOROOPNA 3629

OVER THE YEARS WE HAVE seen innumerable 2m antennas described in technical publications, each making extravagant claims to performance. Since the advent of novice licensees using the 2m band, along with the increase in repeater installations across the countryside, it seems appropriate to once again describe a simple 2m antenna that can be constructed with the minimum of mechanical ability and cost.

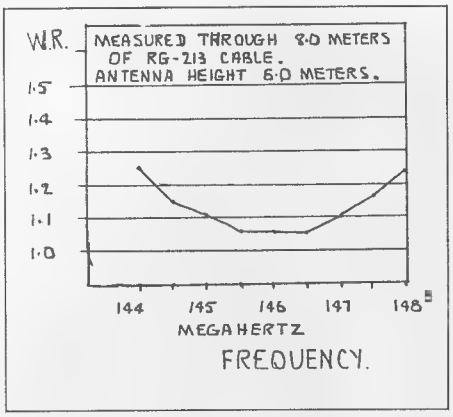
This antenna is the "Unipole". It is basically a quarter-wavelength antenna with the usual quarter-wave performance. The major difference is that it is a "folded" quarter-wave or half of a standard folded dipole used commonly on Yagis etc.

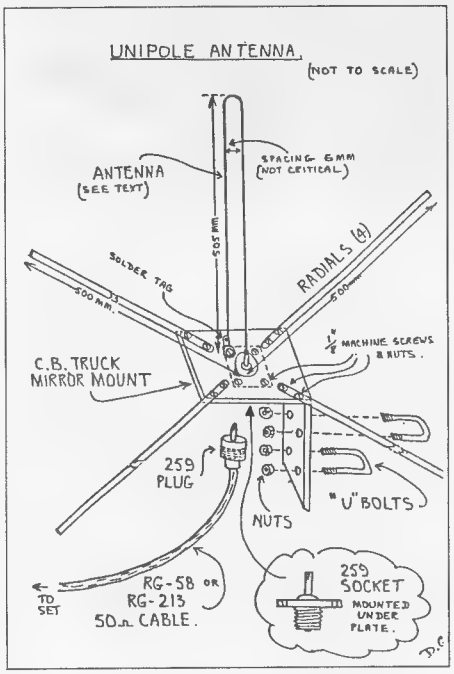
The usual quarter-wave vertical antenna does not present a 50-ohm impedance at its base. To obtain this necessary figure, the antenna is slightly lengthened, thus making it no longer a true quarter-wavelength antenna. To produce the more correct quarter-wavelength with a 50-ohm base impedance, this antenna is "folded" and hence the name unipole.

Performance of this antenna has been noted to be marginally better than a normal quarter-wave vertical, and the impedance match (SWR) is certainly better with a broader frequency range.

The construction is simple using readily available components along with some "junk box bits". The main component is a standard CB type "mirror mount" bracket used to mount whips on the heavy duty mirrors of trucks. These are readily available from most CB shops at a moderate price. Of course, those with workshop facilities could easily fabricate a bracket from 3/16" aluminium plate along with suitable 1/4" U-bolts.

. A Standard PL259 flange type chassis socket is mounted on the bracket using four machine screws. There may be a need to ream the hole slightly if the socket doesn't fit. This requires the use of a small file and some muscle. Place a solder tag under one of the mounting screws to terminate one end of the antenna. The radials are made from aluminium tubing of any diameter between 1/4" and 1/2". Scrap from old TV antennas is most suitable. The radials are attached to the bracket with pop rivets, self-tapping screws, or small 1/8" diameter machine screws. The radials need to be mounted solidly as they will no doubt be used as a convenient perching spot for the local birds.





The antenna proper can be made from any available suitable material such as aluminium, wire or brass. Copper wire salvaged from old transformers or electric motors can be used providing it is at least 1.5mm in diameter. Any thinner wire tends to be too fragile. Perhaps the best material to use is 1/8" bronze welding rods. These are available in various lengths, and if one length is not long enough to form the antenna, a soldered joint can be easily made at the top bend of the antenna.

Of course, bronze solders well, and a good connection can be made to the PL259 socket and earth tag secured under the mounting screw. Prior to final connection, a good clean with steel wool will make for easier soldering.

When completed, the antenna can be checked using a good quality SWR meter. However, if one is not available, the antenna can be used as is because experience has shown that the SWR is normally low and no adjustment is necessary (see SWR graph measured using an RG-213 lead eight metres long).

In common with all antennas, the coaxial cable used should be of good quality with minimum loss. RG-58 is suitable for runs up to five metres, with RG-213 better for greater distances. *(Don't forget to waterproof the exposed end of the coax cable at the antenna to prevent water getting into the cable and spoiling it - Ed).* The antenna should be mounted on a mast at maximum available height and in the clear.

The antenna is "omnidirectional", ie it radiates equally in all directions, so there is no problem with having to rotate it. With this antenna mounted on a chimney or similar structure, and using a standard 2m radio, good repeater access is assured as well as good simplex range : All this without too much strain on the wallet!!! **ar**

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Getting Started with Amateur Radio Satellites

Part 9 – A hitch-hiker's guide to orbital geometry.

BILL MAGNUSSON VK3JT
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I KNOW THAT THOSE OF YOU who have followed the first eight parts in this series won't be put off by the title. I referred briefly to orbital geometry and Keplerian elements in part 4 and advised you to go off and read a textbook about it. Since then I've been asked to come up with a simple explanatory article. Well, there isn't really a simple way to do it, but I'll try to keep the jargon and maths down to a minimum.

Simply put, orbital geometry means a complete description of the shape and position of a satellite's orbit. Once we understand a bit about orbital geometry, we can make sense of these Keplerian element things everyone seems to be talking about these days. Satellite orbits are in general very stable, but all satellites experience very small variations in their orbital shape and position. These tiny fluctuations are caused by non-uniformities in the earth's gravitational and magnetic fields and the gravitational influence of the moon and the sun. They may be of significance to NASA in long-term orbital decay predictions, but to the casual satellite user (that's us) their effect can be neglected. The experts call them perturbations.

So, in order to describe a satellite's orbit, what do we need to know? Fortunately for us, Kepler did most of the groundwork a long time ago, and he did it without the aid of computers. He was looking at the orbits of large planetary bodies, but the principle holds good for home-made planets as well.

There are eight things we need to know about a satellite's orbit in order to describe it sufficiently accurately for our requirements. These properties or definitions are called Keplerian elements in honour of Kepler. Let's examine them in turn.

But, first, who so many? Well, remembering Murphy, the main reason is that even orbits that we refer to as being "circular" are really slightly elliptical. Some are very close to being truly circular but, since none actually is, we need to define their exact elliptical shape. And that's not easy.

The first of our Keplerian elements is the **eccentricity.** It's a measure of the elliptical nature of the orbit. A truly circular orbit would have an eccentricity of zero. For those mathematicians among us, the eccentricity is defined as SQR((1-(b/a)^2)) where b and a are the semi-minor and semi-major axes of the ellipse respectively.

As an example, the eccentricity of the low-earth orbit "circular" satellites is typically around 0.001, and the highly elliptical phase 3 satellites around 0.6 to 0.7. The longer and thinner an orbit, the greater the eccentricity. AUSSAT and other geostationary satellites typically have an eccentricity of about 0.0001. There are no units for eccentricity, it is an expression of condition rather than quantity. An orbit can never have an eccentricity of exactly 1. Can you see why?

Before we can go any further you need to be familiar with the term **ascending node.** This is not a Keplerian element, it is a point on the equatorial plane where the satellite's orbit crosses the equatorial plane going from south to north. There is, of course, another one on the other side called the descending node, but it is the ascending node that is used in describing the orbit.

We can now look at the next Keplerian element, **inclination.** In theory, a satellite can be made to orbit anywhere around the earth, but some positions are much more useful than others. A low-earth satellite's range of communication can vary from a few hundred to a few thousand kilometres, depending on its height above ground. If set into an orbit around the equator, it will never "see" any more than a thin strip of the earth plus and minus 15 or 20 degrees latitude. This may be all you're interested in, but it's more likely that a greater coverage would be required.

If a satellite is set into orbit around the poles, ie a polar orbit, it will cover the entire surface of the earth twice each day. This is because inertia keeps the orbit stable against the star background and the earth rotates inside the orbit. The effect is that from the observer's point of view, the satellite appears to pass over different places each time it orbits the earth.

The **inclination** of the orbit is the angle (in degrees) between the earth's equatorial plane and the satellite's orbital plane. The angle is measured anti-clockwise from the equatorial plane, about the ascending node. In the case of low-earth, near-polar satellites, this angle is usually between 80 degrees and 100 degrees In the case of very large and heavy satellites like MIR and the space shuttle, the inclination is usually much lower. This is because inclination is a function of launch latitude. In launching very large satellites, advantage is taken of the rotation of the earth, ie the "sling-shot" effect. By launching in a west-to-east direction less power is required in the launch vehicle. This results in a lower, but generally satisfactory inclination, of between 30 and 50 degrees depending on the launching facility latitude. (Look up the inclination of MIR and STS).

Now things start to get a bit more complicated. We know that the earth is rotating on its axis. One revolution takes approximately 24 hours. Wait a minute, that seems like a funny thing to say. Everyone knows the earth takes EXACTLY 24 hours to do one revolution! Oh yes, try again. What we call a 24-hour day is very handy for us in that it brings us back to roughly the same position relative to the sun each day. But we're not in exactly the same position as far as the background star-field is concerned. We know the earth orbits around the sun. If we took the stars as a reference for our "24 hour" day, then night would literally turn into day on our clocks by halfway through the year! This would make things a bit difficult so we synchronise our clocks to the sun rather than the star-field. We have to resort to leap years and leap seconds to keep things in order in the long term. Now what does this have to do with satellite orbital geometry?

Since the earth revolves on its axis, and the sun appears to move in our sky, and the moon's orbit does crazy things we won't even go into here, we can't use any of these as a reference to describe a satellite orbit. The best and most stable thing we have is the background star-

field. A common reference point used in astronomy is Aries, and it is this star system that is used in establishing a reference for all man-made satellite orbits. The reference is called "the first point in Aries".

Now this next bit is probably the hardest to grasp, but here goes. A Keplerian element called the RAAN or RA is used to fix the orbit in space, ie in reference to the background star-field. It's full name is very grand indeed. It is called the Right Ascension of the Ascending Node. This is an angle in degrees measured between two lines. The first is a line from the centre of the earth to the first point in Aries. The second is a line taken from the centre of the earth to the point of intersection of the celestial equator (not the earth's equator) and the hour circle of the ascending node. The celestial equator can best be described by envisaging the stars of the night sky as if they were painted on the inside of a huge sphere. Polaris, the north pole star marks the north pole of the sphere and the extension of the earth's equatorial plane out onto the sphere would be the celestial equator. The line out through the right ascension casts a point onto the celestial equator and the angle between that point and the first point in Aries (as viewed from the centre of the earth) is the RAAN, whew! I warned you it was complicated. If you want to understand this one better I suggest you get hold of a good basic astronomy book and read up on right ascension, declination and GHA.

In an ideal system the RAAN would be held absolutely constant by inertia. Murphy as usual, sees to it that things don't work out that way and the RAAN changes a little each day due to the non-spherical nature of the earth. Satellite designers make use of this phenomenon when choosing an orbit for low-earth orbit satellites. By selecting the correct orbital geometry, particularly the inclination, the RAAN can be made to slip or precess by about one degree per day, ie about 360 degrees per year. This makes the orbit sun-synchronous. The orbit will always look the same if viewed from the sun. It's then a lot easier for designers to work out a long-term power budget since satellites are mostly solar powered and the amount of power depends on the angle at which the sun's rays hit the solar cells.

If you follow the published sets of Keplerian elements you will see that the RAAN of many of the low-earth satellites change by about one degree per day.

Two more definitions at this stage, although you've heard the terms before. The **apogee** is the point of the elliptical orbit farthest out from earth. The **perigee** is the point closest to earth. They lie at opposite ends of the major axis of the orbital ellipse. In order to work out where a satellite is in our sky at any given time (and that's the purpose of the exercise), we need to establish exactly the position of the ellipse around the earth. This is done by measuring another angle called the **argument** of **perigee.** We've established the ascending node earlier, so now we can define the argument of perigee by measuring the angle between the ascending node and the perigee point. This is measured in the orbital plane, looking from the centre of the earth.

The next Keplerian element is the **mean motion.** This is the opposite or reciprocal of the orbital period of the satellite. It is measured in revolutions per day, whereas period is measured in minutes per revolution. Mean motion is usually quoted to an accuracy of eight decimal places.

That just about describes the orbit completely but we need another element to work out where the satellite is around the ellipse at any particular time. This is called the **mean anomaly.** It is the angle (looking from the centre of the earth) between the perigee point and the satellite at the instant when all the other measurements were taken.

The **mean anomaly** is a very important point for all our computer calculations, so it needs a time reference. This pinpoint in time is known as the **epoch time** and, although not strictly an orbital element, it is published along with the elements as they would be meaningless without a time reference. It usually takes the form of year, day, decimal day. It will look something like 91213.12345678 ie, year = 1991, day number 213, plus (0.12345678) of a day. It is the instant when someone pushed a button to send a radar ranging signal up towards the satellite. Using doppler shift analysis on the return signals, all the Keplerian elements can be calculated to describe the orbit.

Once again in an ideal situation, that would be all that's necessary to work out just about everything we need to know about the satellite's position. But, once again, things are less than ideal. The culprit this time is Murphy's atmospheric drag.

All man-made satellites experience atmospheric drag. In the case of the geostationary satellites it is so small it can be neglected. The same is almost true for the high orbit Oscars like 10 and 13. Their drag is very low but cannot be completely neglected. Satellites in low-earth orbit, however, experience considerable drag and this is what ultimately causes the orbit to decay into the atmosphere and the satellite to burn up.

It can't be regarded as a true "Keplerian element", but the atmospheric drag is published along with the Keps in the normal element set. It is called **drag** or **decay rate** or N dot. In maths terms it is half of the second derivative of the mean motion. That is, the rate of increase of the mean motion per day per day. It is in fact an acceleration. It's usually specified as a very small decimal fraction of a rev/day/day. Typically values of **decay** for Oscars 10/13 would be 0.0000001 whilst for Oscars like Uosat would be 0.00001 rev/day/day. This figure is often given in exponent notation as (again typically) 1.4e-5 rev/day/day. It is the rate at which the orbital period is decreasing each day.

This is a bit strange because, if the period decreases, the mean motion increases, and that means the satellite goes faster. One would expect that if drag is "holding the satellite back" then its velocity would decrease. Strange as it may seem, it does actually go faster. This is because all the drag factors combine to slightly decrease the satellite's altitude, and that means it has to go faster to maintain orbit. It will continue to increase in velocity until its orbit takes it so far into the atmosphere that it burns up. If drag caused it to slow down then some sort of balance would be set up and it would stay up there forever. That doesn't happen. As an example, the mean motion figure for UoSat-2 for day 62 of 1989 was 14.630744. By day 80 of 1991 it had increased to 14.664819. An increase of 0.034 of an orbit per day in about two years. In that time UoSat-2's orbital velocity had increased from 27057kph in 1989 to 27078kph in 1991. Its altitude had decreased from 686 to 675km in that time. When launched on 1 March 1984, UoSat-2 had an altitude of nearly 700km. You can see that after some 38,000 orbits the drag is starting to take effect, causing a more rapid decline in altitude. But it still has a long way to go. When launched it had an estimated orbit life of about 50 years.

I know of two excellent texts on this subject. I recommend that you read them. The first and most useful is the document file contained in Franklin Antonio's excellent graphic tracking program, Instantrack. This is a very "down to earth" version (excuse the pun). The other is in the UoSat handbook, available from Amsat-UK or the University of Surrey. This is a more technical, but still easy-to-handle, version.

The Keplerian elements so derived are published regularly and used widely by amateurs and professionals to keep track of satellites. They are plugged into computer programs which work on them to give antenna pointing co-ordinates and other useful information.

Next month I'll discuss how computer programs handle the Keps and detail some of the software available. **ar**

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The Field Day Friend

TOM ALLEN VK7AL
22 KAROOLA RD
LINDISFARNE 7015

I HAVE NEVER BEEN A GOOD stone thrower, yet many a time on a field day I have endeavoured to cause a stone suitably(?) tied to a rock with a length of fishing line attached, to clear a tree branch, at say 30 feet, only to record a clear miss or to see the arrangement fall apart halfway up.

Certain states, I believe, allow the use of an ancient, but efficient, slingshot to be used by radio amateurs for the erection of aerials for field day use, so I decided that such an article would be a suitable addition to the assorted aerials (wire) and lengths of rope in the boot of the car. However, being unable to find any details on construction, I decided that some non-amateur experimentation was necessary.

List of Materials

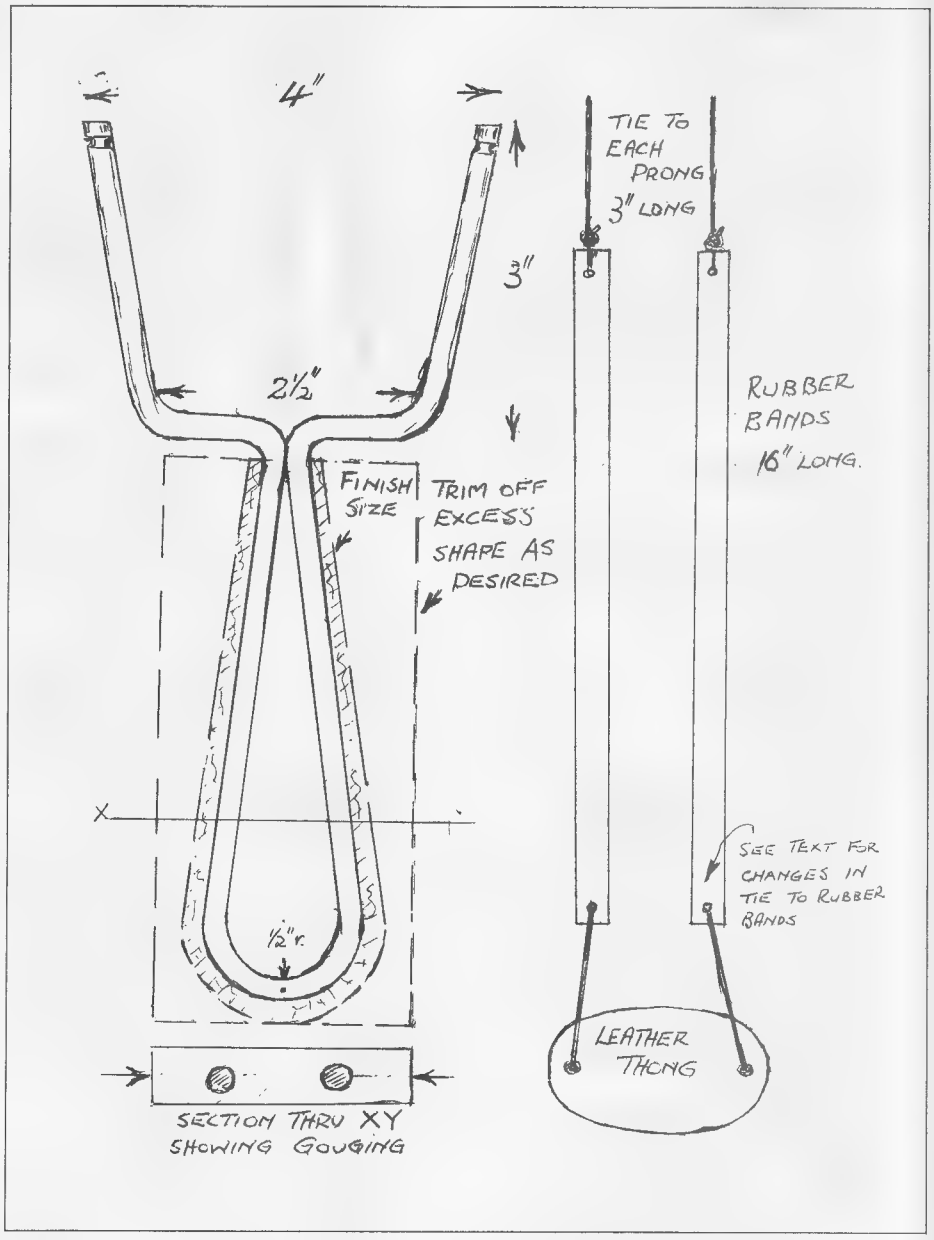
Piece of mild steel rod 20" x 3/16"
Hank green fishing line
1.5mm dia Lead sinker pear shaped 2oz
Rubber bands 1/2" wide 8" dia (1/8" square section would be better)
Piece of leather for thong (boot upper)
Soft pine for handle 2 pcs 5-1/2" x 2" x 1/4"

Construction

1. Centre punch the centre of the length of mild steel then bend to shape as per diagram - a gas torch would be a help in making the bends much more easily. Stick as close to the measurements as possible unless you have big hands and massive shoulders.

2. Having successfully bent the prong to shape use the closed section as your pattern for making ready your two pieces of handle for the gouging procedure. Ensure the handle parts fit snugly around the prong. For the handle parts, I obtained from a cabinetmaker a couple of pieces of King Billy pine, a nice soft wood for easy working. It is strong when glued along its full length, and finishes well. When you have trimmed the excess and arrived at the finished size, a couple of coats of polyurethane clear varnish finish the job.

3. The tie at each end of the rubber is not satisfactory through holes as shown, as the holes tend to become slots at the most inopportune time! Fold the ends over for about 1/2" and tie around the fold tightly for a much better result.



4. About 1/4" down from the top of each prong make a shallow indentation to prevent the top ties from sliding down the prong. Complete the sling as shown, and there you have your non-technical, non-electronic, easily operated, getter-overer for field days.

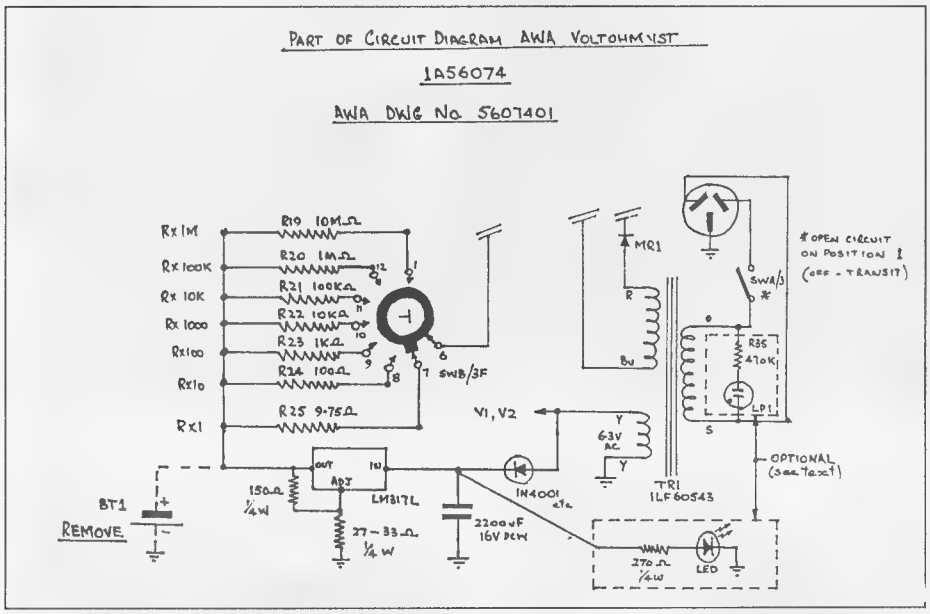
The final word is that these things are **dangerous** in the **wrong hands** and should be kept in the locked car boot out of reach of children. Good luck, good shooting and better aerials for field days.-

(Thanks to the late Ken Gott VK3AJU, these devices are now legal in Victoria when used by radio amateurs for the approriate purpose. The legal position in other states is not known - Ed)

Modifications to the AWA Voltohmyst

(1A56704 or 2A56704 Versions)

JOHN WEIR VK3ZRV
20 SCENIC CRES
ELTHAM NORTH 3095



THERE ARE PROBABLY A number of people like me who have in their possession a Voltohmyst which is pressed into service at some time or other in the shack. About this time the problems start. Namely, you cannot set the ohms because the battery has gone flat, or at the worst has leaked all over the innards of the unit, with drastic results. An added hazard is that the neon power lamp has gone black or does not work, although the latter problem does not stop you using the unit. It is a pity to have a piece of equipment where all functions or facilities are not working.

This modification overcomes these problems and also enhances the look of the Voltohmyst in respect to modern-day test equipment. The complete modification requires only four resistors, one power diode, one LED and a low-power three-terminal adjustable voltage regulator.

The actual fitting of the parts involved I will leave to the ingenuity of the person carrying out the modification. Another important factor is that there is no need to drill holes or deface the basic unit in any way when these changes are made, and also it does not change the calibration settings of the unit.

From the diagram you will see that I have used the 6.3VAC filament winding and half-wave rectified it with a diode and smoothing capacitor before feeding the resultant DC to the input terminal of an LM317L (TO92) three-terminal voltage regulator. The resistor values shown will give approximately 1.5VDC at the output terminal, which is connected in place of the 1.5V battery. Should you require the replacement of the neon "power on" lamp you will need to remove the neon and the 470k resistor and replace it with a LED (your choice of colour) and a series dropping resistor. A convenient tie point for the LED is the tagstrip behind the meter where the neon was located.

Having done these changes you will have no more trouble with flat or leaky batteries or neons that do not work and you will have confidence that when you want to use the Voltohmyst all the functions will be operable. An SASE to me (QTHR) will receive a prompt reply should you run into any difficulties.

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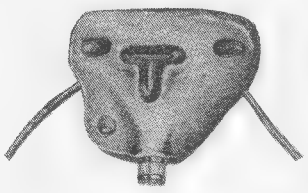

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Mini Equipment Reviews

RON FISHER VK3OM

THIS MONTH IN MINI REVIEWS we will take a look at two very useful antenna accessories from the extensive range of Stewart Electronic Components P/L of 44 Stafford Street, Huntingdale, Victoria. Stewart is Australian agent for many American companies, and one of the more recent of these is AMERITRON. Amongst their range, I spotted just the thing I was looking for, the RCS-4 remote coax switch.

When I was installing my new antenna system out here in the bush, I came across a problem. With the main antennas about 70 metres away from the house, I needed either a lot of low-loss coax or a single run of coax and a remote switch. The RCS-4 was indeed the answer. And I now have only one run of coax,

I lashed out and got some Belden 9913 which reduced the losses to a very low figure. The RCS-4 comes in two parts, the control unit that sits on the operating desk, and the actual remote switch that goes as close to the antennas as possible. But the best part is yet to come.

The RCS-4 does not require a separate cable to operate the switching circuits. It all goes via the coax cable. The circuit is simple and very clever. With no power supplied from the control box, antenna No 4 is selected. Three relays are used to switch the other three antenna connections.

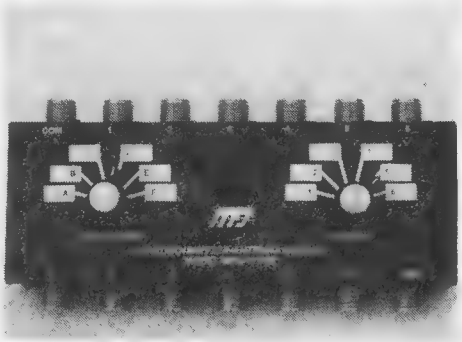
These are activated by sending up the coax either positive DC, negative DC or AC power. The coax is, of course, isolated by blocking capacitors so that the voltage does not get into the antenna or the receiver. Very clever. Ameritron claims an overall loss of less than .05dB and a VSWR of less than 1.1:1 up to 30MHz.

It should be noted that this unit is for use on the HF bands only up to 30MHz. I have now had the RCS-4 in use for several months with excellent results. If you need to switch antennas up to 250MHz, Stewart also stocks the RCS-8V which allows selection of five antennas but requires a separate control cable. The RCS-4 is priced at $354 and the RCS-8V at $409.20.

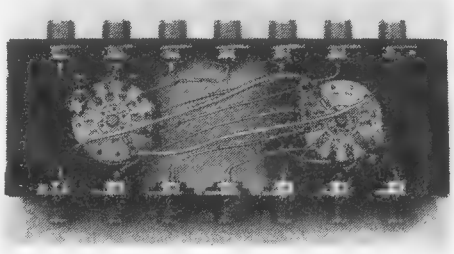
While at Stewarts a few weeks ago, I noticed the MFJ Transmitter/Antenna Switch model MFJ-1700B. MFJ is another American company represented in Australia by Stewart. The 1700B is quite a switch. In fact, it is two switches in one. The combinations are endless, but as a basis it can switch six antennas to six transceivers. The unit is very well made and is fully enclosed in a strong metal cabinet; the switches are heavy duty ceramic insulated, and the unused connectors are automatically grounded. It is rated at 2000 watts PEP for 50 or 70 ohm loads. The MFJ-1700B is usable to 30MHz. A great way to clean up the RF switching around the shack. The MFJ-1700B is priced at $140. **ar**

Ameriton Remote Coax Switch Control unit in the author's shack.

Ameriton Remote Switch mounted on the tower.



MFJ Antenna Switch



MFJ Switch Interior

HELP STAMP OUT STOLEN EQUIPMENT - ALWAYS INCLUDE THE SERIAL NUMBER OF YOUR EQUIPMENT IN YOUR HAMAD

Equipment Review

The Yaesu FT-990HF All-Mode Transceiver

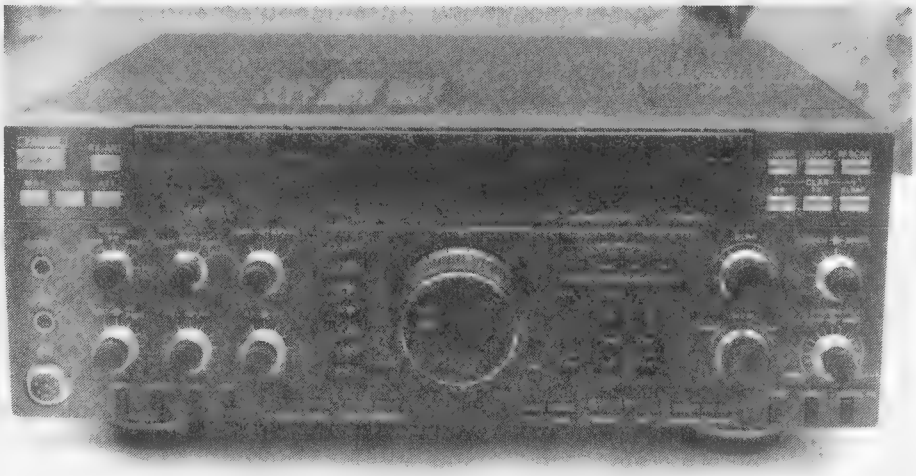
RON FISHER VK3OM
GAALANUNGAH
24 SUGARLOAF RD
BEACONSFIELD UPPER 3808

IF, AS THE YAESU ADVERTISING says, the FT-1000 is the "best of the best", then the FT-990 must be a close second best. It has been said that the FT-990 is an FT-1000 less the dual-receive capability. That's not quite true. There are other differences, but in the main areas of handing and general performance, there is not much to choose. However, back to the beginning. The 990 is both smaller and lighter than the 1000. It achieves this in two ways. Firstly, there are less electronics to enclose, but more importantly, the inbuilt AC power supply is a lightweight switched-mode unit. With dimensions of 368 x 129 x 370mm, it is about three-quarters the size of the FT-1000, and at an all-up weight of 13kg, is just about half that of the FT-1000.

Naturally, the receiver tunes the full range from 100kHz to 30MHz with tuning steps of 10Hz. Two 10-bit direct digital synthesisers are provided to give both smooth click-free tuning and also to give fast transmit/receive switching for CW and digital modes. An automatic antenna tuner is included as a standard feature. This is a similar system to that used in the FT-1000, and it has its own microprocessor to control the 39 memories for quick antenna matching.

The transmitter, which covers all the amateur bands from 160 to 10 metres, has an output of 100 watts on SSB and CW and 25 watts output on AM for 100 per cent modulation. An RF speech processor is included for extra punch on DX contacts.

The receiver interference rejection department has some very interesting facilities. There is an IF notch filter, an IF shift and a digital audio filter with separate high and low frequency cut controls. I believe this is the first time this feature has been incorporated in an amateur transceiver. I will discuss the operation of this later. Selectivity is selectable from the front panel with a choice of 2.4kHz for normal SSB, 2kHz (with optional filter) for narrow SSB, 500Hz for normal CW reception, and a 250Hz position for the optional filter which is installed in the third (455kHz) IF. This is then in series with the 500Hz filter in the second IF for superior CW selectivity. Actually, the CW operator is very well catered for with features that include a built-in iambic keyer with dot/dash memory, a presettable BFO offset and a spotting button for exact tuning to zero beat. The key jack is on the front panel. First featured on the FT-1000, I believe these are the only two transceivers to have this facility. There is also a key jack on the back panel, if you prefer it. While on the subject of front panel jacks, I wonder when we might see a front panel 3.5mm audio output jack to connect to a cassette recorder. All current communication receivers have them, so why not have one on a transceiver? The only transceiver that does have one, to my knowledge, is a Yaesu, the FT-77. Pity that more transceivers don't have them. There is, I should mention, an RCA socket on the rear panel which does provide this facility, and it even has an internally adjustable output level. It would, however, be nice to see an output on the front panel.



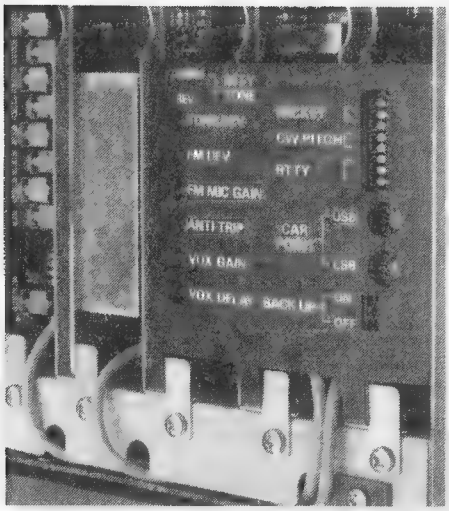
This front panel view of the FT-990 shows up the family resemblance to the FT-1000.

On the subject of recorders, the FT-990 does have provision for the installation of the Yaesu DVS-2 digital recorder. Unfortunately, this was not supplied with our review transceiver, so I must leave comment on it until some time later.

Tuning and band selection on the FT-990 have been very well thought out. To access any amateur band, press the appropriate "Band" button and there you are. Not only will this select the required band, it will also bring up the frequency that was last selected when that band was in use. If you require a particular frequency, then push "Enter" and enter the frequency via the key pad. The third method uses the up/down buttons. These change the frequency in 100kHz steps and, by keeping the button depressed, these go by at a very fast rate. If you need to shift frequency in large chunks, just press the "Fast" button and the up/down rate goes into high gear with one MHz steps.

While on the subject of tuning, the main tuning knob is the same size, and has the same silky smoothness as the one on the FT-1000. The tuning rate is normally 10kHz per knob revolution for SSB and CW, and 100kHz per revolution for AM, FM and packet FM. Again, with the "Fast" button activated, the tuning rate is increased 10 times. As if this is not enough, the tuning rate for any mode can be halved from normal by soldering an internal jumper connection. This is clearly described in the owner's manual.

The receiver and transmit clarifier controls deserve special mention. They are of the type found only on the top class transceivers. That is, there is a total range of plus or minus 9.9kHz. The re-



Here are the "top hatch" controls described in the text.

quired offset can be pre-selected just by turning the clarifier knob, and then brought into use with a push of the "RX" or "TX" button. Push "Clear" and it all resets to zero. All very nice and smooth to operate. Both the main tuning and clarifier readouts indicate to 10Hz, but if for some reason you prefer 100Hz readout, this can be selected with one of the "Switch On" functions. Naturally there are two VFOs, and they can be selected in any combination to provide split operation or two-band operation by selecting either.

The FT-990 on the Air

Plug it in, connect the antenna, and we are ready to go. Push the "Power" button to the "On" position, and ..... nothing; well, not for about two seconds anyhow. I am not sure why; I guess the switch mode power supply has a built-in delay. Once you are used to it, there is no problem. The meter and display illumination is bright and clear. No doubt about it, a good analogue meter really takes a lot of beating. If you prefer a bit less brightness, just hold down the "Fast" button and turn the "Clear" knob, setting the brightness to suit.

While in the initial stages of operation, it's a good time to look at the various "Power Up" options. First off, just for fun or to impress your family and non-technical friends, try the "Las Vegas" diagnostic test of the display and its microprocessor. Press and hold down the 1.5 and 7MHz band buttons while switching the power on. This produces the most amazing effect of all display functions cycling through their functions with, finally, the word "YAESU", followed by the ROM version number displayed. After a couple of seconds, the display returns to normal.

Pressing the 29MHz band button while switching the power on returns the display to 100Hz resolution.

Pressing the 10, 14 and 18MHz band buttons together (three fingers needed) while switching the power on toggles the manner in which the displayed frequency is effected when changing modes. In the default state, switching to and from CW, packet and PKT/RTTY causes the display to change by the amount of offset selected by the CW pitch and PKT/RTTY DIP switches in the top access hatch. After the change, the display will continue showing the same frequency when switching to and from these modes.

While on the subject of the top hatch, there are some very interesting controls hidden up there. Two interesting controls not seen before on amateur equipment are the USB and LSB carrier switches that allow the carrier insertion point to be moved up or down in 20Hz steps. They in fact allow the operator to select the audio response balance to suit his particular requirements.

FM deviation and microphone gain controls as well as tone deviation for the 88.5Hz sub-audible tone for operation into some 10m FM repeaters are located there.

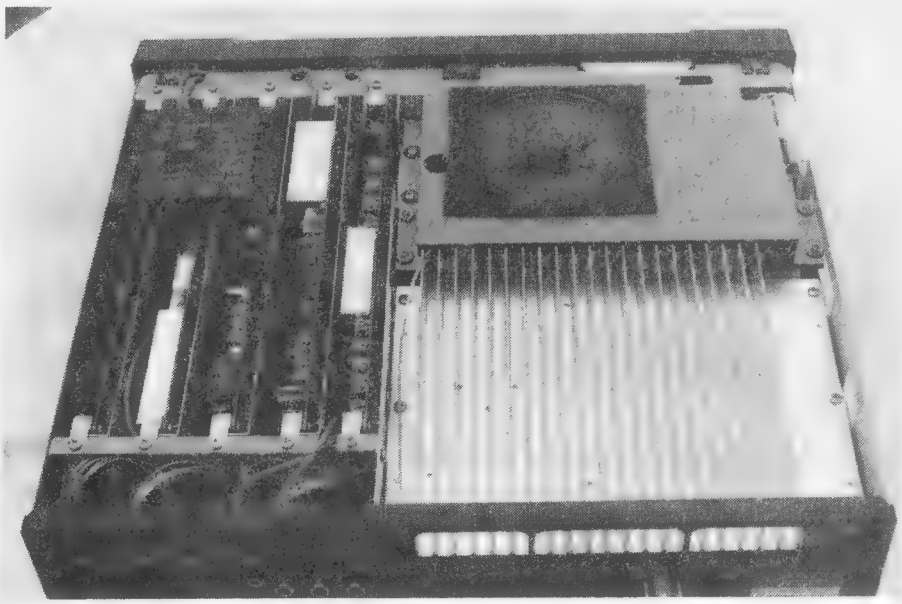
A group of DIP switches allows adjustment of firstly packet FSK tone, the CW tone and, finally, the shift for RTTY transmission. A slide switch allows the mark and space to be reversed for RTTY transmission.

Well, let's have a listen around the bands and see how things sound. The smoothness of the tuning control was quickly appreciated, and the bright amber frequency readout seemed slightly larger than usual, and certainly very legible. First impression of the received quality of SSB signals was that they sounded a bit on the muffled side.

So, up with the top hatch and quick adjustment was made to the USB/LSB carrier points. I switched both to the point of least bass response and tried again. This time it was better, but I still felt it lacked high frequency response. However, the audio was very clean and helped to a large extent by a very good AGC system. The switchable AGC offers four options: off, fast, slow and auto. The auto position gives slow for SSB, and fast for AM reception. I must admit I tended to leave it in the slow position most of the time. Overall, the AGC action is excellent, with no pumping and a very well controlled decay.

The tuning knob would have to rate as one of the smoothest in the business, and it has one thing the others don't have - a finger hole. With the fast button held down, the tuning rate steps up from 10Hz steps to 100Hz steps. This is most useful as it is still a tuning rate as distinct from a stepping rate. You can still tune SSB quite satisfactorily and then go back to the 10Hz rate for fine tuning. Many transceivers go to a 1kHz fast tuning step which is, of course, too broad to resolve SSB and, in most cases, too fast for even AM tuning.

While on the subject of AM, I consider the quality of AM reception is far too bassy. No doubt the AM selectivity is rather tight, but it seems there might be quite a bit of top cut in the audio end of the receiver. It sounds as if the tone control is on full top cut, but unfortunately



Top view of the transceiver with the covers removed. Note the massive heat sink and the plug-in boards on the left.

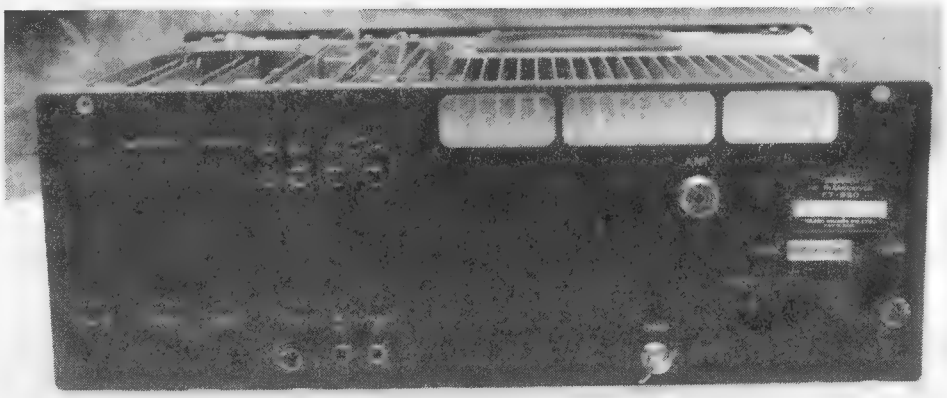
there is no tone control. This might be why even SSB sounds a bit bottom heavy. In the QRM reduction department, there are three weapons to bring out. The IF shifts, the notch filter and the digital filter. Firstly, the IF shift works very well. It's no better and no worse than any other IF shift, but still a very handy thing to have. Unfortunately our review transceiver did not have the optional 2kHz filter fitted for me to check its action with the IF shift. Generally the shift works better with a narrower filter. The notch filter is of the IF type, in other words it works at the IF frequency and not at audio frequencies as some do. Most IF type notch filters are effective in removing an interfering hetrodyne, but often, in doing so, remove a lot of the wanted signal as well. In this regard, the 900 filter is better than many, but still suffers from the problem to some extent. Perhaps it's time that manufacturers considered putting in two notch filters, one at the IF frequency and one at the audio end.

Now to the amazing digital filter. When I first saw the FT-990, I guessed (incorrectly) that this device was in fact a shift/width or SSB slope tune control. Well, it is and it isn't. It is actually a sharply tuned top-cut filter (tone control if you like) and a sharply tuned low-cut filter. The steepness of the cut at both ends is really quite amazing. In use, it has an effect similar to the IF slope tune found on, say, my old TS-930 transceiver. It certainly sharpens up the apparent selectivity to a remarkable degree and, in fact, most of the action takes place in the first half of the knob rotation. From there on, there isn't much left to cut. Used in conjunction with the IF shift, it can do a very good job of removing QRM. But, like all audio devices, it cannot remove a strong interfering signal from the actual pass band. So, is it worthwhile? No doubt about it - yes! But, would I swap it for a good slope tune system? No way. Where it does shine is on CW where, with careful adjustment, you can get a single signal effect.

Last, but by no means least on the receive side, is the memory system. There are 90 memories to play with. You can enter frequency, mode, bandwidth and repeater offset into the memory. One of the nice features is the automatic repeater offset for 10m FM repeaters. Overall, the memory system is very easy to use.

The FT-990 on transmit

The 990 has a nominal power output of 100 watts, and not 200 as does the FT-1000. However, this is not to be considered in any way a disadvantage. This puts it in the same class as most other transceivers. Dick Smith kindly supplied an MD-1 desk microphone to use with the 990 and reports on this were first class. The RF speech processor is of a brand new design. It incorporates a frequency shift facility (FSP) which allows the operator to set the audio frequency response to "customise" his signal.



Rear panel of the FT-990. All connections are easy to get at.

The filter band pass is actually shifted relative to the carrier to increase or decrease the low frequency cut-off point.

To set this, just press and hold the "Fast" and "RF FSP" buttons and turn the tuning control until the display shows the required offset. This indicates from -0.3 to +0.5, giving a total variation of 800Hz.

Setting this to suit your voice, plus a few dB of processing, produces an outstanding SSB signal.

I also tried it with a standard Yaesu hand microphone and found that reports were also good, but not up to the MD-1.

Metering on transmit is very comprehensive. You have the choice of the following: RF power output, PA collector current, SWR, RF speech compressor level, ALC and final amplifier collector voltage. The meter illumination and calibration are excellent. CW keying was found to be clean and free from clicks.

The FT-990 Accessories and Options

A good selection of plugs is supplied with the FT-990. A four-pin, a five-pin and an eight-pin DIN plug allow most external connection to be made. Two RCA plugs, a quarter-inch TRS plug for CW key connection and a 3.5mm plug for external speaker connection are also packed with the transceiver.

An AC power connector fitted with an IEC socket and a selection of spare fuses are also provided.

In the options department, you can choose the TCXO-2 high stability Master Reference Oscillator and the MD-1C8 desk microphone which we will be looking at in a separate mini review very shortly. A high quality external speaker, the SP-6 features switchable audio filters.

Two optional filters, one for CW with 250Hz bandwidth, and an eight-pole 2kHz narrow SSB unit, are both available.

If you want to control the FT-990 from your personal computer, then you might consider the FIF-232C interface unit. All in all, enough to satisfy the most critical operator.

The FT-990 Instruction Manual

The instruction manual is well presented. Its overall quality is not quite up to the FT-1000 manual, and there are one or two errors. For instance, the quarter-inch TRS key plug is labelled as a half-inch plug, and the 3.5mm external speaker plug is identified as a quarter-inch plug. However, overall the book is well written and very clearly illustrated, and there is plenty of information on the CAT system computer control, with a full page of CAT commands.

Again, as with the FT-1000, I regret that a full technical description of the rig is not included. Yaesu is using new techniques in the 990 and it should tell us how they work. Again, as with the FT-1000, I hope a workshop manual might be soon available. If and when this occurs, I will be happy to make this the subject of a mini review.

The FT-990 Conclusions

The performance and operation of the 990 are very good. I would prefer to have the "Shift/Width" control of the FT-1000 over the "High/Low" digital filter, but in all other respects the 990 is a delight to use. The built-in lightweight AC power supply also puts it in front of other medium priced transceivers.

Our review transceiver was kindly supplied to us by Dick Smith Electronics, to which all enquiries should be directed.

The FT-990 will retail for $3295, which includes a bonus MD-1C8 desk microphone. **ar**

Parkes Radio Telescope - 30 Years of Discovery

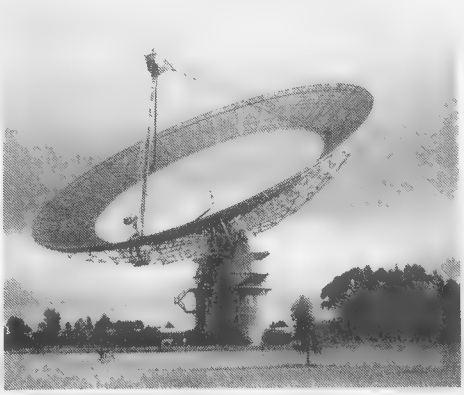
BY IAN MCGOVERN AND ALAN E WRIGHT VK2JOY
PO BOX 276
PARKES 2870

THE CENTRAL-WEST OF NEW South Wales in Australia is an area both of beauty and stark contrasts. He we may suffer scorching-hot, arid summer days - or impassable floods following on torrential rains. Here we see magnificent, deep-orange sunsets fading into the black velvet of crystal-clear night skies. And here, amid thousands of hectares of wheat fields and rich sheep-grazing land, we find the largest fully steerable radio telescope in the southern hemisphere.

The Parkes 64m dish is one of Australia's - and the world's - premier research instruments. Since 31 October 1961 the telescope has remained at the forefront of astronomy, conducting pioneering research into such fields as the structure of our galaxy, the discovery of quasars and the elucidation of the enigmatic pulsars. This year astronomers everywhere will be celebrating the 30th birthday of the commissioning of one of the most versatile and productive astronomical instruments ever built.

Any telescope is conceived against a background of the then-current astronomical problems. The giant Parkes dish was no exception. In the mid-1950s, radio astronomy was in its infancy: the quantity and distribution of hydrogen gas in our own, and other, galaxies were unknown; few continuum surveys of the whole sky had been made, and those which had been made were in conflict; it was believed that atoms and molecules other than hydrogen would have detectable spectral line emissions - but none had been found; and the nature of the source of energy in the few extra-galactic radio sources so far discovered was a complete mystery.

It was clear at the time to Australian radio astronomers that a sensitive and versatile radiotelescope, capable of tackling these problems, was urgently needed. To "Taffy" Bowen, then head of the CSIRO's Division of Radiophysics, it was equally clear that the instrument had to be a giant parabolic reflector telescope. Important input into the design of the new instrument came from Barnes Wallis (of Dam-Buster bomb fame). Partial funding was provided by the Carnegie and Rockefeller foundations of the USA and, to cut a long, traumatic and fascinating story short, the Parkes radiotelescope came into operation in 1961.



The Parkes Radio Telescope

From then until the present day it was to achieve everything - and much more - that its designers had envisaged. Just a few of the highlights have been: the identification of the first quasar, 3C273, in 1961, and the subsequent discovery of more of these extraordinary objects than any other radio telescope; the whole of the southern skies has been systematically surveyed twice for new radio sources and their optical counterparts identified; and the telescope has played a leading role in the *Apollo* and *Voyager* space missions with the world seeing that *"first small step for mankind"* on the moon relayed via the Parkes dish.

In January 1986, two major events occurred. For the first time since the Apollo moon missions, the Parkes telescope tracked two space probes. The European Space Agency (ESA) launched the Giotto satellite into the infamous Halley's Comet, bringing back absolutely stunning results. Also in that year the *Voyager 2* deep space probe visited the planet Uranus and its moon Miranda. Then, three years later in 1989, the Parkes antenna provided a vital downlink for *Voyager 2* as it encountered one of the most distant planets in our solar system, Neptune and its moon Triton.

As it moves into its fourth decade, the Parkes dish has been assimilated into a larger entity, the *Australian Telescope National Facility*. As well as Parkes, the Australia Telescope consists of five 22m dishes located 300km to the north of Parkes, and a single 22m dish near Siding Spring Mountain, the home of the Anglo-Australian Optical Telescope. From time to time, this massive synthesis array of dishes will include the NASA Tidbinbilla 70m dish near Canberra, and a 26m dish in Hobart belonging to the University of Tasmania.

Footnote: The Parkes Radio Telescope will hold an open day on Sunday 6 and Mon 7 October to celebrate its 30th birthday. Between the hours of 9am-4pm there will be many activities including the opportunity to go through the telescope itself. One of the many special events planned will be a display by the Parkes Amateur Radio Club. There will be displays of the old and the new, from vintage radios to packet radio. With many thanks to the Department of Transport & Communications, the exhibit will operate with a special callsign, VK2BRT (Big Radio Telescope). Listen for this callsign on the two days as it could come up on any band at any time. One hundred contacts made over the two days will have the opportunity to receive a very special limited edition QSL card.

If you would like more information on radio astronomy or the open days, write to: Ian McGovern, CSIRO Visitors' Centre, Australia Telescope Parkes, PO Box 276 Parkes NSW 2870. Or phone (068) 62 3677, fax (068) 62 3341. **ar**

Murphy's Corner - Errata

We managed to mix up some callsigns in the September issue. Robert McGregor, author of *The Three-Coil Trick*, was described as VK3XS instead of his proper call, VK3XZ. To make matters worse, the synopsis given to the Divisional broadcasts was also incorrect. Chris Peake VK3CXP, author of the "Over to You" letter "CB and Amateur Radio" had his call corrupted to 3XCP.

Apologies to both gentlemen for the errors.

Darwin Amateur Radio Club Incorporated VK8DA

SILVER ANNIVERSARY

THIS IS A CONDENSED HISTORY OF THE PAST 25 YEARS OF THE DARWIN AMATEUR RADIO CLUB INCORPORATED, WRITTEN BY HENRY ANDERSSON VK8HA, 1ST HON LIFE MEMBER OF THE CLUB.

The first meeting of the then Darwin Radio Club was held on 7 November 1966.

In those days there were not many resident amateurs in Darwin, so the amateur population consisted mainly of public servants from other states visiting for a three-year term of duty. Some stayed longer than their initial term, whilst others liked what they saw and are still in Darwin and rural areas. They were a very enthusiastic and helpful group to their fellow amateurs and intending amateurs, contributing to the start of the club and leading on to VK8DA, the club station, and VK8VF, the 144MHz beacon.

Membership of the club always seems to vary between 25 members and 50, but rarely does the membership climb to more than 50.

Club premises and meeting places have always posed a problem, and initially meetings were held in private homes; however, over the years the meeting place has graduated to various educational establishments in the Darwin and suburban areas.

After securing a building on the East Point Reserve, the club's dry season meetings were held in the open, outside the club bunker.

The first General Meeting of the club, the 46th to be held on East Point premises, was on 3 August 1970. As this day was a public holiday, no business was transacted, instead antennas were erected at East Point and VK8DA was operated on air.

From March 1972, the club obtained the use of the Civil Defence Headquarters on the corner of Stuart Highway and Parap Road and, in return, it was agreed that all club members should join the Civil Defence and also assist with radio communications in emergencies. Club members were also to participate in civil defence and emergency exercises which were held approximately three times per year. The club also had the use of the Civil Defence Base Station transceiver (ex-amateur band transceiver) for airing of VK8DA.

During October 1972 VK8VF was operated on a test basis. During the same month the club name was changed from

Darwin Radio Club to Darwin Amateur Radio Club, and in November 1972 the new 52MHz beacon was handed over by Peter VK8ZKA for continuous operation.

The Civil Defence Headquarters was used as a meeting place until it "flew away" on Christmas Day 1974.

The 99th meeting to be held on 6 January 1975 had to be cancelled, as only one member attended. The 100th meeting was held on 1 February 1975, with member VK8s KK, ZCF, HA, ZTW, CM, ZRD, ZCW, ZCJ and Terry Hine, now VK8TA, in attendance. Apologies were received from VK8s BB, AZ, KS, CEG, ZBQ, OI and members evacuated from Darwin. A good time was had by members and visitors, with much discussion about how each spent the early hours of Christmas Day 1974.

From August 1975 the club had the use of the Civil Defence Bunker at the new address of the Civil Defence/Emergency Service Headquarters in Bishop Street. This bunker was cyclone and bomb proof, but was very damp as it was underground. It also had a standby power plant which was very useful during reconstruction of power lines after Tracey.

In February 1978 the club obtained the use of the Casuarina High School for meetings, as the Civil Defence required the bunker for its own activities. About the same time the club was offered a one-hectare block of land in the Berrimah area. However, it was impossible to accept this offer due to the cost of a club building, fencing, sewer, electricity and improvements to the block, although the club did apply for a grant from the Northern Territory Government, but was unsuccessful.

In 1979 East Point Club House was restored and, in September 1979, Mr Dondas, the then Development Minister, officially opened VK8DA.

During the opening, members demonstrated their ability to make contact with almost any part of the world at any time, by using different frequency bands.

Contacts were made with the president of the SA Division of the WIA, many club members who had left Darwin after Tracey, most states of Australia and many overseas countries.

During 1982-83 the Department of Health Stores at Fannie Bay became vacant. Many sporting clubs obtained use of the building, and our club applied for a portion of the building to use as a meeting place, lecture room, home for VK8DA etc. After much correspondence with the appropriate authorities, a room was granted.

Various working bees were organised to paint the room and to clean up the club's portion of the garden. A 144MHz band Slim Jim was erected, and an application for the erection of an HF wind-up tower is in the pipeline.

At the end of 1984, the VHF beacons, and the relay of the VK5WI Sunday morning broadcast, had been transferred to Fannie Bay. A small AM transmitter had been purchased from the Department of Aviation in Darwin and used for the 3.555MHz VK5WI relay.

The new home for the club was officially

opened by Mr Dondas on 24 November 1984.

Amateur radio classes for beginners are conducted at Fannie Bay, and Morse code lessons are transmitted by VK8HA on 3.555 and 146.6MHz almost daily at 1000 UTC. C90 cassette tapes are available from Henry VK8HA, with Morse speeds up to about 20wpm, for the exchange of a clean C90 cassette tape.

In early 1983 Bill VK8ZWM and a group of RTTY enthusiasts formed a RTTY group called "Territory Amateur Radio Teleprinter Society". This group records the VK2TTY Sunday morning broadcast, and an edited version with local news added, is rebroadcast by VK8HA at 1000 UTC on 3.555 and 146.6MHz on Sunday evenings. TARTS callsign VK8TTY is used for the broadcast and other RTTY activities.

VK8DA has nets on Sunday mornings after the broadcasts on 3.555 and 146.5MHz and VK8TTY on Sunday evenings after the RTTY broadcast on 3.555 and 146.6MHz.

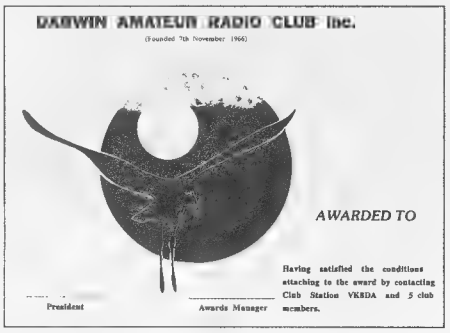
VK8DA Issues Two Awards for Amateurs

Top End Award is available to all VK stations who work 15 members of the club and one contact with VK8DA or VK8TTY ... SWLs who hear 10 club members and VK8DA or VK8TTY ... Any band, any mode.

Applications to Henry VK8HA, Box 619, Humpty Doo, NT 0836, and include $3.00.

Bougainvillea Award is issued free to all amateurs and SWLs visiting Darwin during the festival which normally coincides with the Northern Territory Self-Government Celebrations on 1 July each year. The requirement for this award is to work/hear/eyeball 10 members/amateurs in Darwin during the festival and to see Henry VK8HA to collect the award at Trippe Rd, Humpty Doo, 2.5km past the Humpty Doo Hilton on the Arnhem Highway.

The services of the club have been augmented by a packet bulletin board


DARWIN AMATEUR RADIO CLUB Inc.
(Founded 7th November 1966)
AWARDED TO
Having satisfied the conditions attaching to the award by contacting Club Station VK8DA and 5 club members.
President
Awards Manager

under the call of VK8DA on the following frequencies: 14107kHz LSB 300Bd, and 144950kHz FM 200Bd.

Apart from repeater VK8RTE on 147000kHz, the club has installed a new repeater on the Marakai Building in Darwin City. Callsign is VK8RDA, and it operates on 146700kHz.

The club will be celebrating its silver anniversary on 7 October 1991. An award will be issued to amateurs during the period October and November 1991, and is called the Silver Anniversary Award. Requirements for this aware are to work/hear VK8DA and five members of the club during this period.

Cost is $5, and applications to Awards Manager, Henry VK8HA, Box 619, Humpty Doo, NT 0836.

The club will be arranging a dinner on 9 November 1991 for the celebrations, and also some bus trips to famous spots around Darwin. There will be a cruise on the harbour on board the m/v "Sturm Vogel" (VK8LR/MM) if weather permits.

Anyone in Australia, and maybe DX, who wishes to attend any of these functions can contact any of the three foundation/honorary life members still in Darwin, namely: VK8HA, 88 2450, VK8TA, 81 5516, VK8DI, 85 1068 AH and 89 7622 BH. You can also contact the Secretary, Frank VK8FT on 27 6275. **ar**

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Amateur Radio and Emergencies

LEIGH BAKER VK3TP
(FEDERAL WICEN CO-ORDINATOR)
552 CANTERBURY RD VERMONT 3133

FROM THE 1920S AMATEUR radio operators have been well known through the press for their assistance to people and communities that are going through emergencies. Many distress calls from ships have been intercepted and passed to the authorities for action. In times like Cyclone Tracy the only external communications are again by amateur operators. The reasons that we are "on the spot" and are able to assist are very simple.

While the public is well aware that local amateurs have the ability to, and regularly do, talk to amateurs in other countries, most are not aware that there are well organised voice repeater and data repeater networks that cover all of our populated areas as well as a lot of our sparsely populated country. Amateurs may live in isolated areas, but they are never isolated.

There are some 17,000 persons who are licensed as amateurs by the Department of Transport and Communications and they are spread right across Australia. Because these people are familiar with the theory of radio and its application, in times of emergency like Cyclone Tracy, they can very quickly repair damage to their systems and become operational again. Those people who live in isolated communities are well aware of the need for reliable communications, and groups like the SES are well aware of those amateurs who live in their areas. WICEN is a group of amateurs who work with or in support of the emergency services as and when required. In the north of Australia, a group of amateurs belonging to WICEN provide a regular "weather watch" for the SES for coastal towns and marine use. Other amateur groups provide an Australia-wide "marine watch" for yachts and other non-commercial shipping. Yet another group has been set up to send health and welfare traffic for the general public in times of emergency. Radio amateurs have been assisting their communities in these ways during emergencies since the early 1920s.

Most of these groups form part of the community service arms of the Wireless Institute of Australia (WIA) which was set up to represent the interests of the amateur operators in this country. There are also some 120 affiliated radio clubs, together with numerous allied interests throughout the country.

WICEN is just one of the "community service" parts of amateur radio, and its objective is to make the resources of the amateur radio service most effectively available to the community in times of disaster or sudden need.

A Federal WICEN Co-ordinator is appointed by the Federal Convention of the Wireless Institute of Australia. He acts as a focal point of contact and co-ordination between the State Co-ordinators and the Natural Disasters Organisation (NDO) and co-ordinates any amateur communication facilities required on a national scale for disaster purposes. WICEN operators offer the disaster control authorities various communications modes, with an equally wide range of sophisticated equipment, and the trained manpower to operate the facilities and, if required, competent relief personnel for the authorities' own communications terminals - all at little or no cost to the authorities, the government or the general community.

The trained operator core of WICEN is available on request by the appropriate authorities and, in the case of a larger emergency, would act as a nucleus to enable the rest of the amateur radio population to be put to use.

From the amateur viewpoint, participation in WICEN training and exercises is a preparation for the time when the amateur can offer a unique service to the public during a time of need, and hence put something back into a hobby which is capable of offering so much in return. It must be remembered, however, that the emergency services which will call on amateurs for assistance, such as the police, ambulance, Red Cross, Health Department of the State Emergency Services, are professionals involved in the preservation of life and property, and hence assistance which is unco-ordinated or untrained in the special requirements of these services is not acceptable.

Accordingly, the WICEN organisation provides the necessary liaison and training so that the assistance that is given is a reliable communications facility capable of working in conjunction with the emergency services.

At this time better than one in 16 licensed amateurs in Australia belong to WICEN. While this may seem a large number, senior representatives are concerned that this membership is too city-based and that WICEN needs to involve more amateurs who live in country towns and in the more isolated parts of this country.

If you can assist or are just interested, please contact your divisional WICEN co-ordinator through the WIA, or join in one of the WICEN broadcasts. It does not matter what level of licence you have or what equipment you have or where you live... we need YOU. Further information can also be obtained from the WICEN phone BBS on (03) 802 0913. **ar**

THE ANTENNA EXPERIMENTER'S GUIDE
(ISBN 0-9516024-0-3) by Peter Dodd G3LDO.
200 pages, 120 illustrations, includes material not previously published. Masts and experimental antennas.
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TRY THIS

Dummy Load Would Soothe My Ears

J.G. Muller VK3LU
23 Loch Ave, Ballarat 3350

MORE AND MORE AMATEURS are acquiring linears and operating without upgrading their dummy loads. The results can be heard every day of the week, specially it seems when I am trying to work some rare DX.

A cheap, easily constructed and satisfying way of reducing the incidence of this interference is to home brew your own dummy load. I used an old method that first appeared in *73* magazine of May 1978.

The load is purely resistive at 50 ohms and will dissipate 400 watts of RF comfortably.

Parts required:

4 litre can (I use an old mineral turpentine tin)
2 3" x 3" x $^1/_{16}$th brass plates
10 470 ohm 5 watt resistors
1 female coax connector to take PL259 (flanged)
4 strips copper braid 4" to 5" long
4 litres 20/40 engine oil
The cost is less than $20.

Method of Construction

Using a can opener that cuts up the side of the can, remove the bottom of the can. This makes it easier to solder back on later.

Drill the brass plates with nine holes 40 degrees apart in a two-inch circle, with the 10th hole in the centre (see figure 3). Insert the resistors upright in the holes between the plates and solder.

Solder the four pieces of copper braid to the corners of the bottom brass plate. I used braid from coax.

Solder a heavy-gauge piece of copper wire to the centre of the top plate, leaving 2" of wire upright to be soldered to the coax connector.

Punch a hole in the top of the can to take the coax connector. Put the resistor network inside the can and push the 2" of wire through coax connector hole and solder to the connector. Then solder the flange of the connector to the can, sealing if completely (see figure 2).

With the resistor network hanging down 2" in the can, solder the four lengths of copper braid to the inside of the can. This holds the network in place and provides a ground plane effect (see figure 1).

Solder the bottom of the can back on and fill with the oil and, hey presto, you have a dummy load that works, and a grateful ham community.

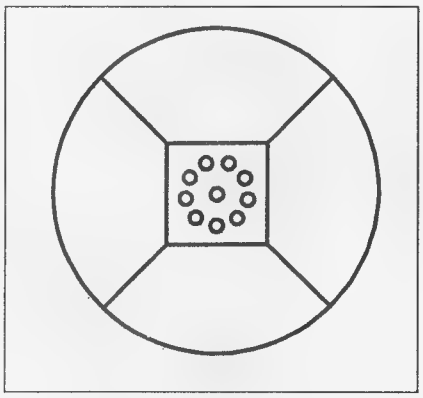

Figure 1: Inside of the can from the bottom.

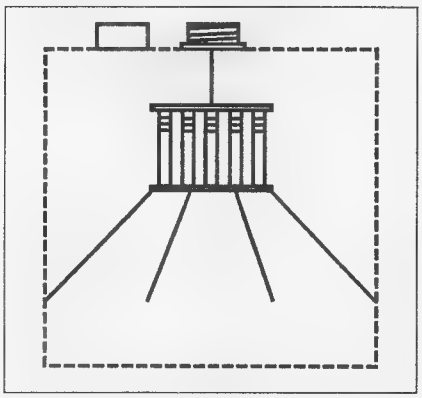

Figure 2: Resistor Network inside can.

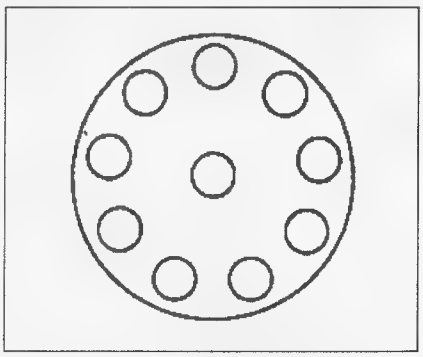

Figure 3: Brass plates after drilling

When in use, either loosen the cap of the can or drill a hole in it to lessen pressure of gas build-up.

Technical Editor's Note: The resistors used must be non-inductive, ie not wirewound. Particular care should be taken with soldering the bottom of the can to avoid leaks. **ar**

How Much it Costs to go on a DXpedition

The proposed budget of the Myanmar (Burma) DXpedition contains the following interesting amounts and items (all in US currency): generators and fuel, $3270; yacht charter, $13,300 for three weeks; two second-hand jeeps and fuel $13,400; security equipment and weapons(!), $4800. For for six personnel has been budgeted at only $10 each per day (approximately $1420) plus, of course, the airfares from and back to Russia for Romeo and other operators.

Stephen Pall VK2PS

ar

A Call to all Holders of a Novice Licence

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Phone: (02) 689 2417

11am to 2pm Monday to Friday
7 to 9pm Wednesday

70 Years in Radio

FRANK PATRICK VK3FJP
(SUBMITTED BY Q FOSTER L30720)

IN 1920, THE MARCONI SCHOOL of wireless was a small single-storey building in 424 Little Collins St. Lionel Hooke was in charge and Joe Williams was assistant instructor. The exam was held four times per year. The minimum age to sit was 18 years. As there was little radio equipment in the school, the student was taken to any ship in port and tested on the ship's set. A few faults were made on the set, such as a bit of paper under a contactor, a couple of wires loosened, and the rookie was supposed to find them. That was the final test and, having been successful, he became the proud owner of a First Class Certificate of Proficiency in Radio Telegraphy under the London Convention.

At that time only two types of transmitters were on use on the Australian coast. The Marconi 1.5kW rotary asynchronous gap or the Telefunken 2.5kW quenched gap. The latter were mainly in ships that had been taken over from Germany after the 14/18 war. Compared to nowadays, the sets were large and heavy. All ships used a "cat's whisker" crystal receiver. The working range of these sets was about 200 miles during daylight hours. All operators in port used to go and sign an appearance book about 9.30am. They were then clear for the rest of the day. Generally, all would then retire to the "local" for a cool glass of morning tea. There, many tales were told of the long distances they had worked: Frisco, VIM or VIP. For some reason, the longer the session lasted, the greater the distances grew! Galena was the favourite crystal receiver material, and operators would carry their favourite crystal with them in their fob pockets.

In the early '20s the valve was being developed. The first Australian valve used was a glass tube about three inches long with two filaments. The elements had a wire coming out each end and these were connected to the set. If a filament burnt out, it was a simple matter to switch to the other set of filaments. Later the four-pin type came into use. AWA developed a valve receiver called the "P1", using `a single valve, and installed them on their ships' gear. Also at this time was the type "F" transmitter, a half-kilowatt. The HF beam wireless for international traffic was in operation by the late '20s. Stations were built at Ballan and Rockbank for this system. Melbourne Radio was set in the Botanical Gardens of Domain Rd.

Frank Patrick VK3FJP during Air Force days

In 1928, when Charles Ulm and Kingsford Smith flew the Pacific in the "Southern Cross" (KHAB), I kept a watch on the frequency. Ulm kept the key screwed down, and every 15 minutes he would open the key and send his report and then close the key again. His CW note came through clearly. Radio was now no longer a novelty.

In 1924, police radio D24 was commenced. Two cars were fitted with radio, and each carried a qualified operator who kept a watch with VIM. When D24 got a call, it would ring VIM to tell the car to ring D24. Later, D24 installed its own transmitters. Ships over a certain tonnage had to carry an operator. Overseas traders had to carry three men, working four hours on and eight hours off. In the European and Atlantic waters, the SOS call was not uncommon. I copied my first SOS one morning. The ship was rolling heavily, waiting for the sea to abate to let us into Alexandria Port. We had just come through the Suez Canal where the "Gillie boys" had come selling Turkish Delight, sickly sweet jelly like jubes. I had eaten a lot, and with the ship loaded with a cargo of bulk wheat for Egypt - not the best of cargoes at any time, when the ship will roll the milk out of the tea.

I was sitting with a bucket between my knees, hoping the ship would sink and end my misery. It was my first bout of mal de mer. That Turkish Delight was lovely going down but coming up it was shocking. Suddenly Alexandria sent QRT SOS. His signal was QSA 10 plus. Never had anyone dying of sea-sickness ever recovered so quickly. As per regulations, I went and woke the senior operator. To my surprise, he did not seem to be very impressed and said 'She'll be okay, its probably a thousand miles off', and went back to sleep. He was right, as the ship was in the North Sea. When an SOS is sent, the nearest station takes charge. He will send out QRT SOS. The other stations will repeat the signal until all traffic is shut down till the emergency is cleared. In this way it had come down through the French, Spanish, Italian stations to Egypt. All 600m traffic has to cease operations at 15-18 and 45-48 minutes past the hour GMT. Any ship, except in an emergency, that breaks that regulation incurs the wrath of all coast stations that heard him. This rule has been in for 70 years and is known as the Silence period.

In 1923, radio station 2LO was operating from the top of the Savoy Hotel in London, it was a real novelty to we Colonials. The senior operator on my ship had got some radio bits and had built a set to hear this new fangled stuff. When we were passing Gibraltar he called out to come and hear London. We crowded round when a voice said "This is Gibraltar testing". It really got us in, and as radio parts were very cheap in Antwerp, we all got bits and pieces to build a set. Valves were three shillings each, other parts similarly priced.

In Victoria 3AR and 3LO used to broadcast on different wavelengths than now. It was decided to use the present frequencies. A test was arranged and after the night session had ended, the station would come up near the present frequency. I was sent to Bacchus Marsh to report on the transmissions. I had a three-valve set and rigged a bit of an aerial out of the hotel room where I was staying. Reception was excellent. As the publican was a keen racing man, I invited him up to my room to hear Eric Welch (I think) call the race. I think the old gentleman had an idea it was a joke, but decided to humour me anyway and came up. I had tuned the set into 3LO, showed him how to put the phones on and tuned

on the set. They were lining up and, finally, there were off. He sat with the phones pressed to his ears. After the race, he said, "It's ### marvellous; come and have a drink." Not wishing to offend him, I went down to the bar. He was really excited and said to his clientele in the bar, "I just heard the races; I could see the horses; come on boys, have one on the house." According to the locals, that Saturday afternoon was a red-letter day - the first time anyone had seen a race from there and the first time he had ever shouted them all a drink.

Between 1930 and 1940 radio advanced very quickly and became an accepted necessity. Aviation had become dependent on radio for in-flight information and safety. Aeradio stations had opened on all routes; these were equipped to cover all flights and most were equipped with direction finding sets, either the Marconi Adcock or the Bellini-Tosi. These were very accurate when conditions were okay. Three classes of bearings were sent. 'A' class was accurate to one degree, 'B' class three degrees and 'C' was five degrees, but was not accepted except as an indication. With a bearing from two stations, the pilot could confirm his position. Later, the NDB (non-directional beacon) came into action, and this allowed the pilot to get his own bearing. In the early '30s the radio range came into operation. A narrow beam was sent along the route. The pilot locked onto this beam and when on course got a steady signal. If he deflected to port, he was warned by a series of dots and dashes; if he drifted to starboard he got a different set of signals *(A one side, N the other - Ed).* These have been superseded by the DME sets. The pilot can now get his position by a flick of a switch. The old days of "by guess and by God" are gone forever

The Royal Flying Doctor Service handles a lot of traffic in the outback. Alice Springs had a teletype line to the Adelaide GPO,and handled all the land line traffic to the outlying stations by radio fone. For years, they carried on the "School of the Air" for the outstation children. Also, the CWA used to hold its meetings by radio. The president would put the motion to the meeting and it would be seconded by a member 500 miles away and would be carried by all the members, some of whom would be hundreds of miles apart. The hospital and base could be alerted by the stations using "SELCALL". Alice Springs would have up to 40 telegrams per day to distribute.

In 1975 I did my last trip at sea as relieving operator on a Greek tanker to New Zealand. Fifty-eight-thousand tons, 19 knots, and a crew of 24. The engineer sat in an office and watched the indicators. If any part of the machinery malfunctioned an alarm would be activated. No more walking round with an oil can in hand feeling bearings for overheating etc. The engine revs were controlled by a console on the bridge. Weather fax, radar screens, ship to shore R/T all on the bridge. En suite in the radio operator's cabin and a feather bed! These here young blokes don't know what a seaman was like in them days. So, think we old gaffers. No more passing the time signal at noon by hitting the bridge floor with a hammer from the radio cabin. The mate on the bridge presses a switch and receives his ZP (position via satellite) and can pinpoint his exact position.

To watch the satellite equipment at Healesville makes one realise the almost unbelievable advances in 70 years in radio. Two television programs are being received simultaneously on one machine; they are separated and two television screens are each receiving perfect TV programs. These were being sent to a Sydney network.

As a young innocent lad I was fascinated by the account of the "Titanic" shipping disaster in 1912 when she went down with hundreds of passengers. The radio officer went down with the ship trying to contact other vessels. There was a ship (the "Carpathia") only 30 miles away, but the watch was closed as ships then only carried one operator. Had he been on duty, he would have heard the distress call. In those days, "CQD" was used; "SOS" came later, as it was more easily distinguishable. What a different story might have been told. An auto alarm was developed and fitted to sea-going radios. Twelve four-second dashes separated by a one-second pause would be sent. Three dashes would activate an alarm in the officers' cabin and on the bridge. Before closing down for the night, the auto would be tested and turned on.

Few remember the big superhet radio receivers that were very popular in the late '20s, the Reinartz, the old web coils and several other circuits that the young lads used to build and boast about. McElroys was up in Swanston St and was the first radio shop to sell all sorts of "the latest " in radio. Friday night and Saturday morning was always a very busy time for those men behind the counter. Radiola, Astor, Atwater-Kent, Mullard and Crossley were some sets the older hams may remember. Sets retailed from 20 pounds for mantel models, to 40 pounds for a good cabinet set. Some of these old timers are still going.

In 1991, the radio officer ends his seagoing career as no ops will be carried. Computers, radio technical advances are responsible. At one time, there were weekly services (passenger) from ports around Australia. There were dozens of freighters trading round all ports. All are gone today. All carried a radio officer. The amateur will soon be the only ones using CW. It is hoped that it will not be dropped from the syllabus.

Editors' Notes:- Frank VK3FJP is one of those rare characters whom one is fortunate to meet but seldom in one's lifetime with an endless supply of anecdotes and history. Frank has seen the development of most of what we take for granted now, starting from the old "spark gaps" to modern satellite equipment.

Frank has been at sea, worked for DCA, the Flying Doctor, on oil rigs in Bass Strait, copied Japanese CW during the war in RAAF intelligence (if you think ordinary morse is difficult, have a listen to the Japanese Kana code some time).

He is still a First rate CW operator, and is active on 20m with a101B and a Butternut vertical. Frank also acts as a Morse examiner for the Eastern Mountains District Radio Club AOCP program.

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Cat D-3350

2 YEAR WARRANTY

$449

Frequency Coverage:	144-148MHz
Channel Steps:	5, 10, 12.5, 20 & 25kHz
Supply Voltage:	5.5-15V DC
Output Power:	2.5W @ 7.2V
Current Consumption —	
Stand-by (with 1 sec. save):	7mA
Receive:	150mA
IF. Frequencies:	21.4MHz, 455kHz
Sensitivity (12dB SINAD):	Better than 0.158uV

Ultra Compact

FT-23R 2m HAND-HELD

The FT-23R is an ultra-compact (just 55x139x32mm) microprocessor controlled hand-held transceiver that offers extremely rugged construction and exceptional ease of use. It covers 144-148 MHz and features include 10 memories which store frequency and repeater offset, 6 digit LCD with PO/S-meter, band/memory/priority scanning, 1MHz up/down stepping for fast QSY, repeater reverse operation, selectable tuning/scanning steps, diecast transceiver casing, FNB-10 600mAh NiCad battery pack giving 2.5 watts output and rubber gasket seals around all external controls and connectors. It comes with a mini 'rubber duckie' antenna, carry case, belt clip, and approved AC charger.

Cat D-3490

Specifications

Frequency Coverage:	144-148MHz
Channel Steps:	5, 10kHz, 1MHz
Supply Voltage:	6-15V DC
Current Consumption—	
Stand-by:	19mA
Receive:	150mA
Sensitivity (12db SINAD):	Better than 0.25uV

2 YEAR WARRANTY

$369

2m & 70cm In One!

FT-470 DUAL-BAND HAND-HELD

Dual-band performance at its best! The FT-470 is a very easy to use hand-held transceiver that offers a high degree of flexibility through the use of a sensible multi-tasking microprocessor control system to provide both 2m and 70cm operation in one compact unit.

Dual independent IF circuits allow several functions to be performed simultaneously, including dual-band reception, and full cross-band operation. The FT-470 also has 21 tuneable memories and 2 VFOs per band, plus inbuilt C.T.C.S.S. (tone squelch) with a paging facility and a wide variety of scanning functions. A back-lit LCD screen shows a 5.5 digit frequency display on both bands simultaneously and a bargraph PO/S-meter lets you know exactly what you're doing. A programmable 'power-saver' system helps maximise battery life, allowing squelched receive current of as low as 7mA. The FT-470 comes with an ultra-high capacity 7.2V 1000mAh NiCad battery pack, carry case, belt-clip, dual band antenna and approved AC charger.

Cat D-3360

2 YEAR WARRANTY **$699**

Specifications

Frequency Coverage:	144-148MHz, 430-450MHz
Output Power:	2.3W (both bands, 7.2V)
Supply Voltage:	5.5 to 15V DC
Current Consumption—	
Stand-by (with 1 sec save):	8mA (each band)
Receive:	150mA (each band)
Sensitivity(12dB SINAD):	better than 0.158uV (both bands)
Size:	55 x 180 x 32mm

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Frequency: 144 —148MHz
Gain: 7.8dB
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 4.53m
Type: 3 x 5/8λ co-linear
Cat D-4850

$199

2m/70cm ANTENNA X-200A

Frequency: 144 — 148MHz, 430 — 450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max. Power: 200W
Max. Wind Speed: 180km/h
Length: 2.5m
Type: 2 x 5/8λ(2m), 4 x 5/8λ(70cm)
Cat D-4860

$199

2M/70cm ANTENNA X-500A

Frequency: 144-148MHz, 430-440MHz
Gain: 8.3dB on 2m, 11.7dB on 70cm
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 5.2m
Type: 3 x 5/8 λ(2m), 8 x 5/8 λ(70cm)
Connector: N-type socket
Cat D-4865

Due Oct.

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23cm ANTENNA F-1230A

Frequency: 1260 — 1300MHz
Gain: 13.5dBi
Max. Power: 100W
Max. Wind Speed: 144km/h
Length: 3.06m
Type: 25 x ½λ co-linear
Connector: N-type socket
Cat D-4870

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HF/6m POWER/SWR METER

A superb wideband SWR/Power meter which boasts quality Japanese construction and a truly accurate P.E.P. metering circuit (unlike many 'other' so called P.E.P. monitor systems). The Revex W502 features solid construction with an all-metal case and a large back-lit meter... and it covers the 1.8 to 60MHz range with less than 0.1dB insertion loss. With 20W, 200W and 2kW power ranges and LED indicators which show average or P.E.P. operation. Requires 13.8V DC @ 200mA power supply.

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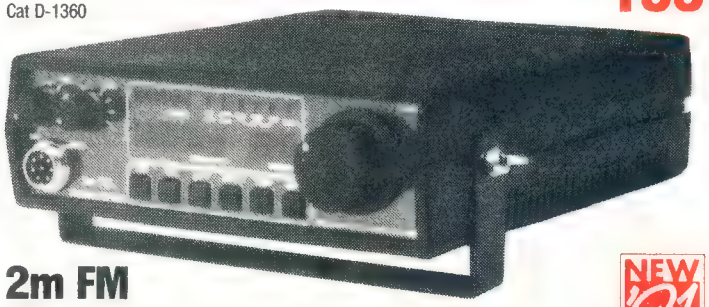

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- Microprocessor control system
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- -60dB image rejection

At this price you can afford to take the challenge! Kit includes all components, hardware, heatsink, detailed construction and testing information, and a pre-punched silk screened front panel. Microphone is not supplied. YAESU D-2110 or D-2105 are recommended.

Cat K-6400

EA Jan, Feb, Mar '91

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Cat D-4820

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Cat D-2930

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Ready for action! Whether in a demanding H.F. mobile situation, or at home in the shack, the FT-757GX II won't let you down.
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Yaesu's new FT-650 all-mode mobile transceiver has been designed with the 6m enthusiast firmly in mind. With continuous reception from 24.5 to 56MHz, you can follow the rising M.U.F. and work the 6m DX as soon as the band opens. Output is a powerful 100 watts on the 24.5, 28, and 50MHz bands (SSB, CW, FM), and the use of 3 Direct Digital Synthesizers results in extremely clean Tx and Rx operation. Particular attention has been made to the receivers performance, with 6 Band Pass Filters and a 2 stage, low noise, RF Amp being used to provide exceptional sensitivity (SSB/CW, 0.125uV) and wide dynamic range. Features include user selectable tuning steps, manual or automatic tuning IF notch filter, an IF shift control for interference rejection, an IF bandwidth control, 105 scannable memories, a Speech Processor, and an effective noise blanker. Includes Yaesu MH-1 hand microphone.

Cat D-3250

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Freq	Callsign	Location	Grid Square
50.053	VK3SIX	Hamilton	QF02
50.056	VK8VF	Darwin	PH57
50.066	VK6RPH	Perth	OF78
52.320	VK6RTT	Wickham	OG89
52.325	VK2RHV	Newcastle	QF57
52.330	VK3RGL	Mount Anakie	QF22
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.440	VK4RTL	Townsville	QH30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.470	VK7RNT	Launceston	QE38
52.485	VK8RAS	Alice Springs	PG66
144.400	VK4RTT	Mount Mowbullan	QG62
144.410	VK1RCC	Canberra	QF44
144.420	VK4RSY	Sydney	QF56
144.430	VK3RTG	Glen Waverley	QF22
144.445	VK4RIK	Cairns	QH23
144.445	VK4RTL	Townsville	QH30
144.460	VK6RPH	Perth	QF78
144.470	VK7RMC	Launceston	QE38
144.480	VK8VF	Darwin	PH57
144.485	VK8RAS	Alice Springs	PG66
144.530	VK3RGL	Mount Anakie	QF22
144.550	VK4RSE	Mount Gambier	QF02
144.600	VK6RTT	Wickham	OG89
144.800	VK5VF	Mount Lofty	PF95
432.160	VK6RPH	Perth	OF78
432.410	VK1RBC	Canberra	QF44
432.420	VK2RSY	Sydney	QF56
432.440	VK4RSD	Brisbane	QG62
432.445	VK4RIK	Cairns	QH23
432.445	VK4RTL	Townsville	QH30
432.450	VK3RAI	Macleod	QF22
432.535	VK3RMB	Mount Buninyong	QF12
1296.410	VK1RBC	Canberra	QF44
1296.420	VK2RSY	Sydney	QF56
1296.440	VK4RSD	Brisbane	OG62
1296.445	VK4RIK	Cairns	QH23
1296.480	VK6RPH	Perth	QF78
2304.445	VK4RIK	Cairns	QH23
2306.440	VK4RSD	Brisbane	OG62
10445.00	VK4RIK	Cairns	QH23

Brunei

Andy VK1DA (ex V85DA in Brunei) returned to Canberra as of February 1991. His last 6m contacts in the V85DA log were on 2/12/90 when the band opened to Japan around 0200. Andy's five-element Yagi was left in Brunei where it will be used by Brian V85EB who has an FT690 and would like to build an amplifier. He will probably be there for a year or so.

An analysis of Andy's 6m log shows a total of 1278 contacts with 874 unique calls. Of these, 787 were to Japan, 54 VK, 13 VS, four HL four YB, two DU, two XX9 and one each to 5H, FK8, KG6, KL7, P29 and JD1.

Looking over his 30 months of operation from Brunei, Andy's impressions are that the tropics are not an ideal place for F layer 6m DX. When the early morning openings to South and Central America were being experienced in VK, ZL and the South Pacific, the band was empty in Brunei as it was a further two hours later.

When the Europeans were being worked by VKs, the band was closed tight at Andy's QTH. One day, while at work, he received a phone call from David Rankine 9V1RH who told him that PA stations had worked VK stations from 0800 to 0830 the previous day. Despite several subsequent days of checking Andy heard nothing.

Many times beacons were heard from VS6, H44 and VK4 without there being any response on six metres or 28.885! The VK4RTL beacon was often audible around 1500 to 1700 with weak, but stable, signals.

Six metres was an interesting band when it was really open to JA. FM contacts were in progress on channels commencing at 51 and going in 10kHz increments all the way up to 54MHz. Andy wondered what the Australian 52.525 FM net channel sounded like at times, as the JAs have something like packet radio operating on that frequency.

We are grateful that, during his stay in Brunei, Andy several times communicated his experiences to his fellow amateurs in VK. We hope he now has some rewarding experiences following his return to Canberra.

Cruising South

During the summer Gil VK3AUI cruised to the Antarctic on the World Explorer mainly for historic interest and bird-watching. He looked for evidence of 6m operations, but found none.

On Macquarie Island he said the shack is in a good spot, but would need some dedication to climb up to it in bad weather. David VK0CK would know about that! On Campbell Island there are high hills obscuring the view, so it would need high angle signals to penetrate there. There were no 6m antennas in sight on the Antarctic continent.

It seems a pity that no opportunities presented themselves for a 6m operator to set up a station on the Antarctic continent in order to explore F type DX during Cycle 22. It may now be a long time before there are any answers.

Using 50MHz

The granting to most Australian amateurs of the privilege to use the lower end of the 50MHz band (in line with more than 150 countries around the world) has provided us with a facility with almost boundless opportunities for world-wide contacts.

When confined to 52 to 54MHz during and prior to Cycle 21, we were placed at considerable disadvantage compared with countries permitted 50MHz. The fact that many amateurs did work overseas countries was, in part, due to an advertising campaign where we let it be known overseas that we could not be worked on 50MHz and that overseas stations would need to shift to 52MHz for legal contacts to ensue.

However, there were problems with this arrangement. First, we had to let the overseas amateurs know we were hearing them on 50MHz. Thus, it was not at all uncommon, when listening to a 50MHz station, to suddenly hear a voice say "you are being heard in VK" and nothing else! Second, it was not always plain sailing for the overseas amateur, as some rigs were not very efficient at 52MHz, and the antennas decidedly poor - our antennas worked better at 50MHz than theirs did at 52MHz - please refer to your antenna theory!

Notwithstanding the above, we missed many countries due to our 2MHz isolation. Also, that 2MHz was sometimes too high for the MUF, with stations on 50MHz but not 52MHz! However, that 2MHz isolation ensured we did not clobber the 50MHz region (particularly the international calling frequency of 50.110MHz) with our domestic and Es signals.

With the approach of the spring equinox and likely availability of further long distance F2 contacts, I continue to support other writers who request that the international DX window should be kept for such contacts. If you do no more than keep out of 50.090 to 50.120MHz (and especially 50.110) it will help. 50.125 has been suggested as a domestic calling frequency and this is close enough to the international window for overseas stations to hear you and break-in if they desire.

Our domestic contests ought to be conducted on 52MHz - it was pleasing to note that during the recent Remembrance Day Contest contacts were made on 52MHz, and that's where the Ross Hull Contest also should be conducted. These days, as most rigs have twin VFOs it is so easy to have one working on 52MHz and the other able to monitor 50MHz by the flick of a switch.

As I am anxious to get off my annual use of the soap-box, what all this means is that you are again being asked to respect at least the international 50MHz segment and keep domestic working to 50.125 and above.

Finally, a suggestion. Would those VK4s and any other eastern seaboard amateurs who have consistently worked the same DX stations with 5x9 reports and who can hear the weaker signals from the states to their west and south-west calling for the DX station, consider helping those stations to make it to what are probably new countries for them! You can help by telling the DX stations which Australian call areas (not callsigns) are hearing them. This used to be done back in the AM days, when there was heavy eastern states QRM and VK6s wanted to work ZLs, then a rather rare occurrence, VK5s would clear a path for the ZLs. Such a consideration today, I am sure, would be appreciated both in Australia and overseas and earn some plus marks for you too.

Early 50MHz Contacts

From *CQ Ham Radio* for May 1991 courtesy Graham VK6RO comes an item re early 50MHz contacts. It appears Bob VK4NG was the first VK station to work Japan on six metres with a contact on 22/1/1956 at 1340 JST to JA1AHS who used an AM transmitter with a 6K6 oscillator, 6K6 doubler to an 807 running 50-60 watts. The receiver was a 6J6, 6AK5, 6AC7, 6J5 into a K/CM/11 tunable IF. The equipment Bob used was not listed.

The article also mentioned other notable contacts as between VK5KL and W7ACS/KH6 for a distance of 8640km on 26/8/1947, VK6HK to VR2CG (Fiji) at 6330km and VK6WG to VR2CG at 6145km, both on 3/1/1955. A 2m contact between VK3GM/3 and VK7LZ/PF bridged 511km on 9/3/1952.

Helium-Neon Laser Contact

From the September 1991 issue of *QST*, courtesy of Bill Tynan's "World Above 50MHz", is mention of an interesting 57.7 mile (92.3km) contact by the Ventura Radio Club group operating K6MEP and WA6EJO/WA6JOX. The group claims a world record for the contact on 474THz (red visible light) using a helium-neon laser. (Where to next? ... 5LP).

General News

The onset of lousy weather conditions consisting of gale force winds, thunderstorms and heavy rain across much of southern Australia during the latter half of August saw greatly diminished activity on all bands. Six metres virtually died, although Steve VK3OT did work JA1 and JA3 between 0400 and 0407 on 20/8.

The cold conditions brought to a halt much of the activity on bands above two metres. Signals on 1296MHz between VK5AKM and VK5LP dropped from 5x9 to 5x1/3. In my own case, much of the time the equipment was disconnected from the antennas to guard against static discharges from lightning, and the antennas were parked in the storm position (south-west). The same occurred with most other stations. With the onset of spring in September we are hoping for improved conditions and the re-opening of six metres.

Late News

It appears six metres will not close! John VK4ZJB reported on 1/9 that V73AT had worked BV2DP around 0318. Incidentally, there seems considerable doubt as to the validity of these contacts to Taiwan as they do not appear to be legally licensed. Also reported that on 2/9 Ron VK4BRG had worked W3s and on 3/9 Brisbane stations had a good opening to W5 from 0030 to 0130. Although I monitored the band all day there was no breakthrough to VK5 or VK3.

With the breaking up of some European countries it is possible new call areas will be available on six metres. New countries are likely to include Yugoslavia (YU), Romania (YO), possibly some USSR republics, and Israel (4X1).

ZL beacons are soon to appear on 50.043 and 50.0525 with the latter being too close for comfort to VK3SIX on 50.053. Please consider!

Steve VK3OT reported to me that he will be processing all VHF awards, and these include WAVKCA and WAS certificates, also the new Grid Square awards for VHF/UHF.

Closure

With little else that is news, there seems to be no need to prattle on. But, by the time you read this, hopefully six metres will have provided some interesting contacts.

Closing with two thoughts for the month: "It was not the apple on the tree, but the pair on the ground which probably caused the trouble in the garden", and "Kindness is a language which the deaf can hear and the blind can read".

73 FROM THE VOICE BY THE LAKE

AR

AMSAT

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD, YARRAVILLE 3013
PACKET: VK3JT@VK3YZW

National Co-ordinator
Graham Ratcliff VK5AGR
Packet VK5AGR @ VK5WI
Please take note of the AMSAT information nets:
AMSAT AUSTRALIA net:
Control station VK5AGR
Check-ins commence at 0945z on Sunday nights
Bulletin commences at 1000z
Frequencies 3.685MHz or 7.064MHz. At present 7.064MHz is used.
AMSAT SW Pacific net:
2200z Saturday on 14.282MHz.

Experienced satellite users and newcomers alike are welcome on the nets. A large body of experience is on hand to answer queries. Listen to the WIA Divisional broadcasts for regular AMSAT information.

AMSAT Australia Newsletter and Computer Software:

Satellite users, whether experienced or newcomers, will benefit by subscribing to the AMSAT Australia newsletter and software service. The newsletter is published monthly by Graham VK5AGR. Subscription is $20 payable to AMSAT Australia, addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001

The newsletter provides up-to-date information on all current and planned satellite activity. Graham also provides a first class software service for satellite users. New software is reviewed regularly in the newsletter.

Thanks a million to Maurie Hooper VK5EA for keeping the flag flying for the past two and a half years. I know the column has been very well received during that time. I hope I can keep up the high standard he has set.

DOVE-1, ie OSCAR-17 has been a bit erratic in operation since its launch in January 1990. It resumed transmitting recently and its telemetry is again available on 145.825MHz (FM). Packet operators will find it interesting to receive and decode the telemetry signals. Dove transmissions are able to be directly displayed using a normal packet radio setup. It also appears to be transmitting forth telemetry as part of the downstream. Signals are strong enough to get good copy on a ground plane if you have a quiet location. Try it. Bulletins sent along with the telemetry indicate that the voice synthesiser should be on shortly. Whole of orbit data (WOD) collection is in progress and the controllers are preparing to upload the final software version. The name DOVE is an acronym for Digital Orbiting Voice Encoder.

PACSAT, ie OSCAR-16 BBS is back on line. Watch the BBS messages and the telemetry text for news of operations. PACSAT has four uplink AX.25 FM channels on two metres with PSK and raised cosine (SSB) downlink on 70cm. For the really adventurous, S band operations will resume shortly.

LUSAT, ie OSCAR-19 is out of service. The file server has crashed and the command team at AMSAT-Argentina requests that users not attempt to use the BBS or digipeater until further notice. Watch PACSAT or UO-14 for updates.

Regular satellite users will be familiar with the works and reputation of Dr Karl Meinzer DJ4ZC. Karl recently raised a few eyebrows at the AMSAT-UK Colloquium (July 1991). He proposed that radio amateurs send an amateur radio spacecraft to *Mars!!* Karl outlined how this could be done using current technology like that in the present batch of Oscars. He suggested a transponder on 2400MHz and a launch along with the planned Phase 3D satellite in 1995. One can only speculate on the new challenges this would pose for satellite users. No doubt it would use the new electrical plasma thruster engine developed by Professor Messerschmitt of Stuttgart University. (An option also for P3D).

ASERA - Australian Space Engineering Research Association. Previously the Australian Amateur Space Engineering Society, formed in July 1990, ASERA has been actively planning the first Australian amateur radio microsat. To be known as VKSAT, it will be

based on the AMSAT-NA microsat design similar to Dove, Pacsat etc. Fund-raising is in progress, but to date has fallen so far short of target that the project has been put on hold. Despite a very generous $2000 grant from AMSAT-UK, and some local support, ASERA has been unable to raise the $20,000 necessary to purchase the microsat engineering plans and specs from AMSAT-NA. These plans are absolutely necessary, as going it alone would be rather like re-inventing every wheel in history. If other countries like Argentina and Italy can do it, why not Australia? This may be the first you've heard of ASERA. If you'd like to know more and (hopefully) support its efforts by becoming a member, the address is below. Please consider giving your support to this effort. It would be great to see VK back up there. How many of you can remember Project Oscar Australis, ie Oscar-5? ASERA is also scheduled to provide an imaging system and a mode-B transponder for the Phase 3D spacecraft. ASERA is based in Sydney and there are active groups operating in other states. Tony Bartell VK3ZOT is co-ordinating the mode-B transponder project in Melbourne. ASERA has close ties with the CSIRO division of radio physics, the Australian Space Office and the AUSROC groups based in Adelaide and Melbourne. Ausroc-1 was launched on 9 February 1989. Ausroc-2 is under construction. Ausroc-3 is planned as a test for the final rocket which is designed to achieve a low earth orbit with a payload of 25-50kg. The ultimate aim is to launch an Australian amateur radio satellite with an Australian built launch vehicle. You may have seen the recent Gladesville ATV test transmission. One of the interviews featured Craig Lindley, President of ASERA. Craig outlined the aims and objectives of the group and detailed progress so far. If you're interested in finding out more about ASERA, contact the secretary at: Australian Space Engineering Research Association, PO Box 184, Ryde 2112.

Software Protection

Readers should note that the sale of software is one of the major sources of revenue for AMSAT world-wide. No revenue ... no more satellites. Heroic efforts by a small number of individuals have given us the opportunity to enjoy some very sophisticated programs. The majority of these are donated to the AMSAT organisation for the express purpose of fund-raising. It must break the authors' hearts to see them pirated by **fellow amateurs.** I am therefore appealing to your sense of fair play when dealing with satellite-related software. Most of it is not, repeat **not** public domain or share ware. Most is copyright and clearly marked so. Please abide by the authors' requests NOT to copy except for back-up purposes. Please don't give a copy to your friends out of the goodness of your heart or because you owe them one. Every time you do this you deprive AMSAT of the very stuff that new satellites are made of. Conscience just pricked you? Then send a donation to AMSAT-VK. Be assured, it'll be passed on to the appropriate place and then *everybody* is a winner. AMSAT is a *non-profit* organisation.

Speaking of Software: Graham VK5AGR recently announced in his newsletter that two more excellent bits of software are available. DTLM (July 1991) from the University of Surrey, and SPLOT. They are for IBM-type machines. DTLM is a tabular telemetry display program. It will handle the UoSats and *all* the microsats. It comes with the necessary utilities to convert KISS capture files to files suitable for use with SPLOT. The SPLOT program will graphically display telemetry on EGA/VGA.

Software files by satellite: Oscar-14, the third operational UoSat from the University of Surrey, is going like a rocket (sorry). UoSat Oscar-14 is a packet radio satellite with a difference. Running 9600bps AFSK, downloading is very fast, and the new "broadcast protocol" makes it a dream to operate. It's not even necessary to be connected to achieve results. Using the appropriate software, the files are tucked away in your system and any bits missed on one pass (holes) are filled in on the next and subsequent passes until the file is complete. I think it's worked by magic. It's probably the most advanced amateur satellite so far and it points the way to the future of amateur radio digital satellites. There are messages, pictures, CCD image files, weather sat pix, computer programs etc. If you don't have a suitable modem but would like to see some downloaded files, Graham VK5AGR has a large selection. They are available for the usual formatted disc(s), donation and return postage. One look and you'll be building a G3RUH modem for sure. UoSat-F or UoSat Oscar-22 is undergoing commissioning and will further extend this form of operation. **ar**

Satellite Activity for May/June 1991

1. Launches

The following launching announcements have been received:

Intl No 1991-	Satellite	Date	Launch Nation	Period min	Apg km	Prg km	Inc deg
036A	COSMOS 2149	24 May	USSR	89.7	377	176	67.2
037A	AURORA II	29 May	USA	1400.4	35509	34660	0.2
038A	PROGRESS M-8	30 May	USSR	88.6	249	191	51.6
039A	OKEAN-3	04 Jun	USSR	97.8	679	652	82.5
040A	STS-40	05 Jun	USA	90.1	302	276	39.0
041A	COSMOS 2150	11 Jun	USSR	100.8	823	785	74.0
042A	COSMOS 2151	13 Jun	USSR	97.8	676	648	82.5
043A	MOLNIYA 1-81	18 Jun	USSR	12h16m	40825	457	62.8
1986 017DV	MAK-1	17 Jun	USSR	Deployed from MIR			

2. Returns

During the period 39 objects decayed, including the following satellites:

1967-027A	Cosmos 151	06 May
1976-116A	Molniya 2-16	21 Feb
1981-020A	Progress M-7	07 May
1987-036A	Cosmos 1838	15 May
1987-036B	Cosmos 1839	08 May
1991-020A	Progress-7	07 May
1991-031A	STS-30	06 May
1991-031B	IBSS	06 May

3. Notes

1990-107A SOYUZ TM-11

The spacecraft's descent vehicle with Soviet and British astronauts landed in Kazakhstan, USSR, on 26 May 1991.

BOB ARNOLD VK3ZBB ar

CONTESTS

(INFORMATION PROVIDED BY THE RELEVANT CONTEST MANAGERS)

Ross Hull Contest 1991-1992

As mentioned in April *AR*, there will be several rule changes for the 1991-1992 Ross Hull Contest. The main changes suggested by entrants were:

1. Contest "days" to begin at 1800 UTC, to encourage evening activity and prevent the mid-morning "peak hour".
2. The contest to be shortened. Tentative dates are Saturday, 21 December to Saturday, 11 January (inclusive). Any comments?
3. Last year's overwhelming advantage to six metres to be corrected by setting the maximum possible score per 6m contact to 10 points, and setting the band multipliers as follows:

6m	2m	70cm	23cm	2.3 GHz	Higher
X 1	X 4	X 7	X 10	X 15	X 20

Under this arrangement, six metres would

run more closely "neck and neck" with two metres and 70cm in scoring potential.

4. Calling frequencies: Much contest operation is between strong local stations, yet the DX calling frequencies are for weak or unpredictable DX that needs to be heard while it lasts. It may help to nominate preferred contest working frequencies to prevent local interference to weak signals. The following are suggested:

6m: 52.100 preferred; otherwise 50.140 (top end of the ZL window). No contest exchanges on or near 50.110.

Other bands; .150 on each band.

VHF-UHF Field Day 1992

This Field Day has now been adopted as a permanent feature of the contest calendar. Next time round it will receive better publicity and hopefully much greater support, especially on the higher bands. Two changes are being considered for this contest:

1. The date: If the Field Day is held on the Australia Day weekend, it would be on Australia Day itself (Sunday 26 January). However, it has been suggested that people may prefer to spend time with their families at the end of the school holidays, and it could be better to run the Field Day on the last weekend of the Ross Hull Contest. The Ross Hull Contest could also be extended by one day to take in the last Sunday, so that field day contacts could also be counted. COMMENTS PLEASE!

2. Scoring: It is proposed to keep the scoring simple by retaining the grid locator system. This could also allow the Field Day to act as an "activity day" for the new Grid Square Award. However, for consistency it is proposed to adopt the same band multipliers as used in the Ross Hull Contest.

ALARA Contest

Marilyn Syme
Contest Manager

Eligibility

All licensed operators throughout the world are invited to participate. Also open to SWLs.

Object

Participation

YL works everyone, OM works YLs only. One contest (combined phone and CW) run over 24 hours.

Starts Sat 9 Nov 91

at 0001 hours UTC.

Ends Sat 9 Nov 91

at 2359 hours UTC.

Suggested Frequencies

Bands to be used are 3.5, 7, 14, 21 and 28MHz only. The following are suggested frequencies for easier location of contacts:

28.380 to 28.410
21.190 to 21.200:21.380 to 21.410
14.250 to 14.280
7.070 to 7.100
3.560 to 3.590

Operation

Phone and CW operation. Each station may be counted twice on each band for credit - once on phone and once on CW. All contacts must be made in accordance with operator and station licence regulations. No net or list operation; no crossmode.

Procedure

Phone: call "CQ ALARA CONTEST
CW: YLs call "CQ TEST ALARA"
OMs call "CQ YL"

Exchanges

ALARA member: RS or RST, serial number starting at 001, ALARA member, name.

YL non-member: RS or RST, serial number starting at 001, or OM name.

Scoring

Phone:
5 points for ALARA member contacted
4 points for YL non-member contacted
3 points for OM contacted

CW: Contacts where at least one operator is novice class count double points, otherwise same as phone

SWL:
5 points for ALARA member logged
4 points for YL non-member logged

Logs

Single log entry (but Australian YL novices entering for the Mrs Florence McKenzie CW trophy should indicate their CW score separately also). Logs must show date/time UTC, band, mode, callsign worked, report and serial number sent, report and serial number received, name of operator of station worked and points claimed.

Sample Log

Date/Time UTC	Band MHz	Mode	Callsign	RS(T) & Serial No sent	RS(T) & Serial No rec'd	Name	Points
10/1101 35	28	SSB	VK3EBX	59001	58028	Joy	5
0141	21	CW	VK3KS	599002	599045	Mavis	10
0600	14	SSB	FK8FA	59025	59011	Aimee	5

LOGS MUST BE SIGNED. Logs also to show full name, callsign and address of operator, and show final score (points claimed). Logs must be legible. No carbon copies. No logs will be returned. Decision of the Contest Manager will be final. Logs must be received by the Contest Manager by: 31 December 1990.

CONTEST MANAGER:

Mrs Marilyn Syme VK3DMS
PO Box 91
Irymple Vic 3498
Australia

MRS FLORENCE McKENZIE CW TROPHY: This will be awarded to the Australian YL novice operator with the highest CW score (not necessarily an ALARA member). Minimum score 50 points. The actual trophy, because of the size and weight, will not be forwarded to the winner, but a certificate bearing a photo depicting the trophy will be sent to the winner each year.

CERTIFICATES will be awarded for the following:
Top score overall
Top score phone only
Top score Australian YL novice CW (Mrs F McKenzie cert)
Top score ALARA member in each country and VK call area
Top score YL non-member in each continent
Top score OM in each continent
Top score SWL in each continent
Top score VK novice
Top score overseas YL novice CW

TROPHIES will be awarded to the following:
Top scoring Australian YL
Top scoring DX YL

(Mrs Florence Violet McKenzie, 1892-1982, was the first woman in Australia to take out a transmitting licence, in 1921. She passed the Amateur Operator's Certificate of Proficiency in 1925 and obtained the callsign 2GA (later VK2SV). Mrs Mac taught Morse Code to thousands of people, particularly service personnel during the 1939-45 war years. In 1984 the Townsville Amateur Radio Club kindly donated a trophy in her memory).

Sunshine State Jack Files Memorial Contest 1991 Results

Ted Mulholland VK4AEM
Box 35 Caloundra City 4551

Section 3, Stations Within VK4

A. TX All Band

VK4CNQ	586

B. TX HF Phone

VK4CRR/M	2387		
VK4BB/M	1216	VK4IS	615
VK4AVR/P	1134	VK4NAD	534
VK4ADD	1040	VK4PVH	402
VK4JMP	861	VK4DRC	385
VK4LT	856	VK4SEA	348
VK4ACL	791	VK4PJ	250
VK4MCY/P	705	VK4PT	220
VK4NSB	652	VK4KRR	207

C. Club Stations TX HF Phone

VK4WIE/M	3267
VK4WIZ	752
VK4BAR/P	506

Section 4, Stations Outside VK4

A TX All Band

VK2MUZ	682	ZL2SM	650

Some Comments from Participants

VK4MCY: I thoroughly enjoyed the competition this year. VK4NAD: ... my first competition and was most enjoyable. All stations conducted themselves politely. VK4PVH: ... to express my thanks to the other operators who took time to help me. VK2MUZ: This is one radio competition that is conducted in the real spirit of amateur radio. VK4CRR: Enjoyed it as usual ... very cold.

Comment by Contest Manager

About the same number of contestants as in earlier years; very pleasing to see newcomer

logs. Special mention to VK4SEA who took opportunity to hold BBQ in conjunction and introduce some newcomers to amateur radio.

Results of WIA 1991 Novice Contest

The number of entries in this year's contest was very disappointing. There were only 26 in the phone section and 5 in the CW section, with one SWL entry. This compares with 34, 10 and 2 respectively last year.

Perhaps the popularity of contests is diminishing or, as one entrant suggested, perhaps the contest just wasn't publicised enough.

An encouraging feature, however, was good participation by a number of clubs.

The Keith Howard VK2AKX Trophy will be awarded this year to VK2LEE for the highest aggregate Novice score.

The Clive Burns Memorial Trophy for the Novice entrant with the highest CW score has been won by VK3NZO.

Both of these perpetual trophies are held on permanent display at the Executive Office. In each case the winner will receive a suitably inscribed wall plaque.

Section A	Novice Winner	VK2LEE
Section A	AOCP Winner	VK3APC
Section B	Novice Winner	VK3NZO
Section B	AOCP Winner	VK6ANC
Section C	SWL	L40018

Individual Scores - Section A - Phone

VK3APC(c)	967	VK6NTJ	215
VK6ANC(c)	882	VK2SRM	188
VK4BB	874	VK7NXX	165
VK2LEE	864	VK2VZB	164
VK3GH(c)	833	VK3KAV	161
VK2ZL(c)	733	VK4VXX	150
VK2GJS	552	VK4AVR	141
VK4NEF	524	VK2ALE(c)	114
VK7NXA	433	VK1EV	90
VK3MBU	384	VK2LE	71
VK6JBL	381	VK2LDB	64
VK2SPT	292	VK2KIQ	62
ZL2LOW	248	VK2IS	60

Individual Scores - Section B (CW)

VK3NZO	64	VK6JBL	28
VK6NTJ	56	VK7NXA	27
VK2VZB	49	VK6ANC	10

Individual Scores - Section C (SWL)

L40018 248

Additional Certificates Recommended

For the highest aggregate novice score for each state, excluding national winners.

VK1 No entrants
VK2VZB
VK3MBU
VK4NEF
VK5 No entrants
VK6JBL
VK7NXA
VK8 No entrants

Other Special Awards Recommended

Section A	Section B
VK4BB	VK6NTJ
VK3GH	
ZL2LOW	

Comments

It was generally agreed that there was insufficient promotion of the contest this year and this no doubt contributed to the lower numbers of entries. It is hoped that this can be corrected next year.

Suggestions have been made that club stations including ZL and P2 should be designated as such by the addition of a suffix to their callsign be published in *Amateur Radio*.

Many entrants indicated their enjoyment of the contest and that they appreciated club participation. The amount of time and effort necessary for an individual to participate in a competitive manner was mentioned by one entrant and he suggested that the time for which a contestant can claim contacts should be limited.

These suggestions will be considered for next year's contest.

Ken Miller, VK2GKM
Novice Contest Co-Ordinator

AWARDS

John Kelleher VK3DP — Federal Awards Manager
PO Box 300, South Caulfield, Vic 3162

When I was appointed to this post, I was pre-warned that it was not an easy job. I can only half agree, because I have found that for all the tedious work involved there are rewards. To date I have processed more than 100 applications for awards to both local and DX operators. To me it has been a pleasure, and congratulations to those who, by now, will have received their awards.

To introduce myself: I am ex-RAAF, where I served as a telegraphist, wireless operator mechanic on H/F D/F (now Telecomm Tech), and finally as a wireless operator air (signaller). I learned my CW in the post office, using an old Clipsal key, a door buzzer and a bank of torch batteries. I started in the WIA as a short-wave listener and, three months later, obtained my licence. I now have about 270 DX countries confirmed, and a shack with plenty of "wallpaper".

RNARS

The Royal Navy Amateur Radio Society is currently sponsoring the following awards:

The South Australian Group RNARS has the HMCS Protector Award, requiring six contacts - a mandatory contact with VK5RAN, a contact with each of two other VK5 members and a contact with a member in each of three other states.

Cost of the award is $5 to Jack Peatfield, 1 Filmer Ave, Glengowrie 5044.

The New South Wales Group RNARS has the HMAS Sydney Award, requiring six points as follows: contact with the club station Snapper island VK2CC counts two points, plus four contacts with NSW members, or just six contacts with NSW members. Cost $5 to VK2KEW, PO Box 159, Warners Bay 2282.

The Canberra Group RNARS has the HMAS Canberra Award, requiring contacts with VK1RAN plus three other VK1 RNARS members and contacts with three special stations such as VK3RAN, VK4RAN, VK5RAN, VK6RAN and VK2CC. Cost is $3 to Barry Bennett, 6 Gibingbell Close, Ocean Shores 2483.

There is also the HMS Endeavour Award, requiring 15 points. Any RNARS member contact is one point, and contact with any club station is two points. Cost $2 to VK5FY QTHR.

The points are readily obtained, as the RNARS has nets on the following bands and frequencies:

Mondays	SSB	3.615	0930z	VK2FYM
Mondays	SSB	3.615	1000z	VK5RAN
Tuesdays	CW	3.520	0930z	VK3QU
Tuesdays	CW	3.527	1030z	VK6RAN
Wednesday	CW	3.527	1000z	VK5RAN

Snapper Island operates most Saturdays, both SSB and CW, various bands between 1000 and 1530 EST.

RNARS members, both local and overseas, are active on 14.052 and 21.052 and thereabouts daily when the bands are open on CW. Put out a call CQ RNARS to be sure of a reply.

The Rhododendron Festival Award, 1991

Rules

1. The Award will run from 2-17 November 1991 inclusive.
2. Contacts may be made on any band, any mode. Each station may be worked **once only** for each separate application for the Award.
3. NZ stations require 25 points from those categories below:

a) Compulsory contact with ZL6RFA - special

event station worth five points.

b) Contact with any Taranaki branch stations:

New Plymouth	ZL2AB	Br 27	3 points
Hawera	ZL2AWW		Br 14 3 points
Rahotu Coastal	ZL2ANN	Br 32	3 points
Waitara	ZL2TO	Br 47	3 points
Patea	ZL2QF	Br 54	3 points

c) Each additional Taranaki station 1 point

4. overseas stations require six points made up of *any* combination of the above in note 3). There is **no** compulsory requirement for overseas applicants.
5. Copy of log and fee to arrive before 31 January 1992 to: The Award Custodian, NZART Branch 27, c/- 45 Robe St, New Plymouth 4600, New Zealand.

Cost

1. For ZL award applications, $6.00 each.
2. For **all** overseas award applications, $US5.00 or a fair equivalent. *No* stamps or IRCs please - cheques preferred.

Note: The award fee covers all return postage charges.

General Information

The Rhododendron Festival Award started in 1988, and each year the award features a different full colour rhododendron flower.

There are *six* different flowers in this series; each one is a limited print with the kind permission of local artist, Janet Marshall. I am sure you will agree they are worth collecting.

This award is available to all amateurs and short-wave listeners.

ZL6RFA and branch stations will be operating on a roster basis during the award period, on or about the following frequencies:

The Rhodo Net 3.593MHz phone most nights from 0800 UTC.

The Awards Net: 3.677MHz phone most nights from 0900 UTC.

DX: 21.150MHz phone most nights from 0700 UTC.

Also popular VHF and UHF frequencies will be monitored, but **any** amateur frequency may be used.

Worked all GI

Rules

1 The award is available to licensed amateurs and SWLs (on a heard basis).
2. All bands, 1.8MHz to 1296MHz.
3. Cards must be for valid contacts on or after 1 January 1979 (1-1-79).
4. Contacts via terrestrial repeaters or with mobile stations are not valid for this award.
5. The award will be endorsed as follows:
   A Mode - CW SSB RTTY Mixed etc.
   B Band - HF or VHF (but not a mixture of both).
6. A checklist of QSLs set out in log form and certified by two licensed amateurs or photocopies of QSLs must be submitted with all applications.
   Do not send QSLs.
7. The cost is:
   Europe -Three pounds, fifty pence (sterling), IRCs 10
   Outside Europe - Four pounds (sterling), $US7, IRCs 12.
   Payment to accompany all applications.
8. Northern Ireland consists of six counties: Antrim, Armagh, Londonderry, Down, Tyrone, Fermanagh.

(Note: The city of Belfast is divided by the river Lagan into Co Antrim and Co Down).

9. Stations outside Europe require the following cards: two from each of Co Antrim and Co Down; one from each of the remaining four counties. Total eight cards. Stations from Europe require the following cards: four from each of Co Antrim and Co Down; 2 from each of the remaining four countries. Total 16 cards.

Applications should be forwarded to: The Award Manager, WAGI, GI4BBV, 11 Drumawhey Rd, Newtownards, BT23 3RS, Co Down, Northern Ireland, United Kingdom.

Cork Radio Club

Rules - Cork Radio Club DX Award

The award is available to licensed amateurs and short-wave listeners.

Contacts must be made with members of the Cork Radio Club or EI stations in County Cork as follows: DX stations need two contacts; European stations need three contacts; EI/G stations need four contacts.

Any band, any mode may be used. QSL cards not required.

Send only certified copy of the log, showing callsign, name, date, time, band and mode used. The fee for the award is six IRCs, or $US4 first class air mail. Every effort will be made to meet claims where insufficient funds are enclosed and a fund has been set up for this purpose. The award is sponsored by the Cork Radio Club DX Group.

Post application and fee to: Awards Manager, W O'Reilly, EI8AU, Mount Oval, Rochestown, Co Cork, Ireland.

The award may be endorsed 2 x SSB, all CW etc.

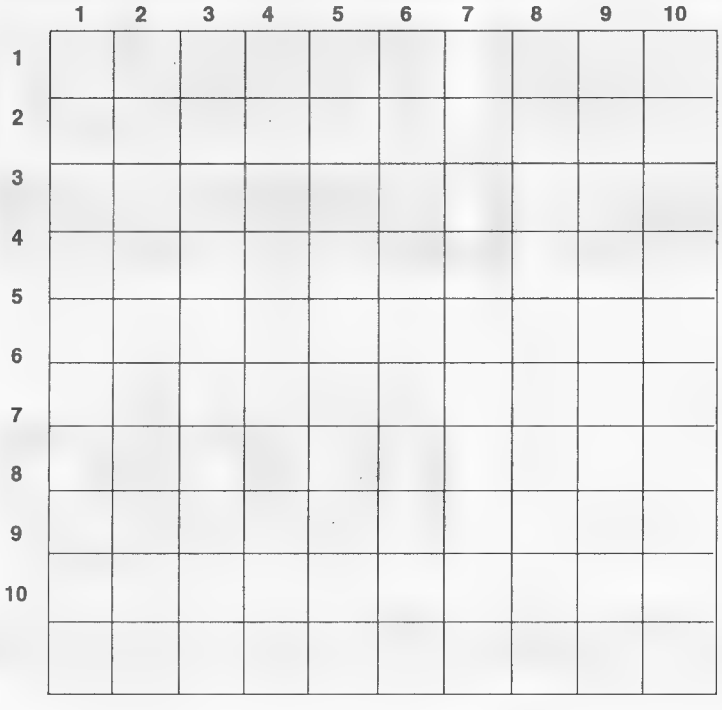
The certificate shows a map of County Cork at lower right-hand corner. All printing is in black, on a cream good quality card. The border and shamrock are in green. Size is 210mm x 296mm.

WIA Antarctic Award

I have received several applications for this award, which I am now processing. However, there is a small "glitch" in the works. To date, no design for the award has been reviewed or decided; the Institute is therefore calling for all artists to submit their designs to: Antarctic Award Design, PO Box 300, Caulfield South, Vic 3162. **ar**

Morseword No 55

Solution Page 56



Across:
1 Cycle
2 Green stone
3 Small delicatessen
4 Ship's record
5 Obstacle
6 Founder
7 Angle
8 Pert child
9 Slice of meat
10 Shoot

Down:
1 Cows chew it
2 Every
3 Useful thing
4 Talk wildly
5 Competed
6 Injection
7 Girl's name
8 Oath
9 Melodies
10 Eat and drink

Audrey Ryan © 1991

HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93, DURAL 2158

..."and please send your QSL card to Box 88 Moscow" ... said the heavily accented Soviet amateur at the end of the QSO. Sounds familiar? For years and years, day in, day out, QSL cards by the hundreds poured into a multi-storey building in Moscow which housed the Central Radio Club of that city. The QSL bureau or that club - the mysterious "Box 88, Moscow" - looked after the distribution of the QSL cards to all parts of the Soviet empire.

With the radical political changes which took part in the USSR just recently, it is now quite possible that each independent republic will establish its own independent system of QSL bureaus. QSL managers all around the world have to be sure they are sending the cards to the correct bureau, otherwise they might see in 12 months time a return package on their doorsteps. What other changes will occur in the crumbling empire? Who knows? Will there be a change in the Oblast numbering system? Is there a possibility of a "new" DX country? What happens to the Soviet awards system? Will amateur licences be issued individually by the remaining republics? What will happen to the vast number of radio clubs and their property? These clubs, until now, were sponsored by Soviet Army establishments, the Communist Youth Movement, the Communist Party and, quite often, by the KGB. How many new amateur journals will surface out of the depth of the dark? Will each republic have its independent radio amateur society? Will the number of Soviet SWL cards decrease, as they will not be provided free any more by the sponsors of the clubs? And finally: will the Soviet postal system change and will it deliver the envelopes containing the QSL cards, the IRCs and/or the "green stamps" intact to the recipients of those letters? These are just a few questions which came to my mind, to which - unfortunately - I have no answer.

Albania - ZA

August was "Albania month". The much anticipated activity which kept practically the whole international DX fraternity on its "fingertips" did not eventuate, despite some positive movements by the intending DXpeditioners. Early August the news came that HA0NNN and HA0MM left Hungary on 4 August for Tirana, the capital of Albania. A few days after, a second group, HA5PP and HA5HA, followed with its communication bus. This "bus" is equipped with a variety of transmitters, antennas and other amateur gear, and will be used in the future for an around-the-world land DXpedition. The two groups intended to work independently at the two ends of Tirana.

On 13 August, late in the evening, a telephone "alert" that ZA2QA and ZA5DX would be on the air within 30 minutes mobilised most of the "ZA" watchers. Nothing happened. Next day, the story came out. According to well-informed Hungarian sources, the licences were obtained and signed by the relevant PTT authorities, but at the last minute the military stepped in, declaring that the amateur frequencies are used by it as communication channels, and therefore no radio amateur operation will be permitted. Hearing this, the two Hungarian groups returned to Budapest. A few days later various French sources made known that it was anticipated that the Albanian parliament will discuss the whole communication question and amateur radio activity in the September session of the Albanian parliament, and that the first operator will be an Albanian national. At the end of August a new wave of "news" spread around which finally became a concrete announcement at the Tokyo annual Hamvention. The Secretary General of the Albanian PTT, Mr Agim Muco, and in a separate statement, the International Amateur Radio Union (IARU) both announced that amateur radio activity, after an absence of 45 years, will resume around the 15 or 16 September 1991. The formation of the Albanian Radio Transmitting Society was announced at the same time. This move, to introduce and train personnel in amateur ra-

SOME THINGS HAVE NO COMPARISON

amateur radio action

The magazine for the serious radio operator

AT YOUR NEWSAGENT EVERY MONTH

dio, is sponsored by the IARU, with the assistance of JARL (Japan), ARRL (USA), ARI (Italy), the NCDXF (Northern Carolina DX Foundation, USA) and the equipment manufacturer YAESU (Japan).

The official launching of amateur radio will be attended by many invited participants from different countries, including Mr Tarjanne, the General Secretary of the ITU (International Telecommunication Union). A number of operators have been invited to Tirana around mid-September to train Albanian operators and work the pile-ups. According to Japanese reports, the group will include three American, two Japanese, three Italian, three Finnish, one German and one Dutch operator. Several callsigns were mentioned, like: ZA1TAA, ZA1TAB, ZA1TL, but it is expected that the opening activity will use the call: ZA1A. It was also said by other sources that the initial activity will be restricted to the 20-15 and 10m bands.

Well, good luck to everybody, and I hope that the pile-ups will be orderly and well conducted. There is no need to rush. This is not a DXpedition lasting a few days or weeks. Amateur radio has arrived in Albania and it is there to stay.

Pagalu (Annabon) Island - 3C0CW

This DXpedition was right on target and, after a few beginner's problems, has run smoothly for 10 days. They even showed up on various nets, despite the unfavourable propagation, and gave the VKs the opportunity to work this rare DX country and IOTA island (AF-039). QSL to: EA3CUU, Pedro Espuna Crespo, PO Box 220, Olot, 17800, Gerona, Spain.

Myanmar (Burma) - XY0RR

After months of preparation, the Russian team - Roman 4K2OT, Gene UA9MA, Harry RA3AUU and Romeo 3W44 - has arrived and went on air on 27 August 1991. The XY group was active mostly on 21295kHz, but showed up also on 14157, 14195 on 28495kHz, and on 80 metres. They were also active on the lower CW portion of the bands. Main activity was with the US and Japan, but early morning and late afternoon openings in VK has allowed the VKs to contact them. This was one of the costliest DXpeditions by Romeo. It was 25 years ago that Myanmar was on the air, known then as Burma. The budget of the expedition was $US45,000, and 40,000 Soviet roubles, but operating from one of the Myanmar-owned islands justified the high cost of the expedition. Travel to the island had to be by yacht. The operators had to travel by jeep through the jungle to meet the yacht south of Rangoon. Because Myanmar is in a state of civil war the operators' safety has cost money. The security equipment and weapons cost $4800, and the yacht charter $13,300 etc. So, if you were one of the lucky ones who worked XY0RR, please consider making a donation to the DXpedition funds, which are collected by Edward Kritsky NT2X, Box 715, Brooklyn, NY 11230 USA. Sponsors contributing over $US25 will receive a special Myanmar DXpedition medal. QSL to: Romeo Stepanenko, Box 812 Sofia, 1000, Bulgaria.

Frank VK1ZL, one of the net controllers of the "222" net.

Desecheo Island - KP2A/KP5

The 10-day operation by VP2VE, KP2A, WU2W, N2KW and VP5JM (YL) was a great success. The operators worked around the clock, being active on all bands including the WARC bands, both CW and SSB. Desecheo is a small rocky island in the Mona Passage, off the western tip of Puerto Rico. The only transport to the island is by a sailing boat, and it takes eight hours of sailing to get there. This was a disciplined operation without the frenzy of the usual dogpiles. QSL to: WA2NHA Howard Messing, 90 Nellis Dr, Wayne NJ, 07470 USA.

Bangladesh - S2

Last month I mentioned that there could be some legitimate activity from Bangladesh in the next two to three months. It was a very happy Jim Smith VK9NS who announced on 29 August that the Bangladesh PTT Board - the S2 version of our DoTC - has decided to introduce and allow amateur radio in Bangladesh. Further details of how this introduction will take place are not known. This is pleasing news for the whole of the radio amateur fraternity. The world is changing, and amateur radio is slowly spreading its wings into countries which previously rejected it on political and internal security grounds.

DX QSLing

In the May 1991 issue of *AR* I posed a number of questions to the managers of outgoing QSL bureaus about the destination of QSL cards where there is no QSL bureau on the "other side", or no QSL manager or route is shown on the card. To my surprise, the managers of the VK5 and VK2 outgoing bureaux replied, and I thank them for their assistance and co-operation.

Briefly, both bureaus say they never destroy any outgoing card, and if cards cannot be forwarded overseas because of the non-existence of the bureau or QSL manager, these cards then are returned by the bureau to the sender. The VK2 bureau said it usually returns 400 to 700 cards per year to the originators for this reason. Both bureaux have instructed their members to mark their cards on both sides with the callsign of the recipient of the cards, which should also include the QSL manager's callsign.

Unfortunately there was no information forthcoming from the other outgoing VK QSL bureaux.

160 Metres DX

Following my notes in last month's *AR* on 160 and 80 DX, it is interesting to read in a letter received from Bob VE7BS some time ago, the following: "The 160m propagation season of May to August is over, and I am happy to report that in the 1990 periods there were more than 200 contacts with about 38 VK stations. Another 37 VK stations were heard here at my QTH, which is about 14km from a small village, and 160km from the nearest high-powered broadcasting station," writes Bob. "My top band antennas are supported from tall trees. The apex of the full wave vertical delta loop is suspended from a pulley at 115ft, and it has a 0.42 base wire about 8ft above the grass. It is fed near one bottom corner, so is vertically polarised and more or less omnidirectional. For the VK sessions it is the more effective antenna when the band opens."

The next opening on 160 metres to North America will start in May next year, which gives the future "top band" enthusiast about six months to construct his special antenna for 160 metres. Incidentally, if my information is correct, there is a newsletter which appears twice a year for the 160m enthusiast. For further information, write to the *Top Band Bulletin*, PO Box 262, Mactier, Ontario, Canada POC 1HO.

Rwanda - 9X5HG

If you still need this particular country for your DX collection, listen in on the ANZA net (21205kHz, check-in at 0445 UTC), or go down to the lower end of the CW band segment and you will find there Hartmut 9X5HG. Hartmut is a professional radio engineer attached to a

German relay station broadcasting in Rwanda. Depending on his working arrangements, you might hear Hartmut around 0500, 1100 or around 2000 UTC times, working mostly in CW, and occasionally in the SSB mode.

Rwanda is a small country in East-Central Africa, just south of the equator (2° south, 30° east, area 26,338km², population estimate is five million; greatest distances - east-west 233km, north-south 177km). Germany established a colony in the area in 1897. It was occupied by Belgium in 1916 and became a mandated territory under Belgian administration in 1923. Its status was changed in 1946 to Trust Territory under the United Nations, and in 1961 became a republic. The population belongs to two main tribal groups, the Bahutu and the Watusi. At present, the Government of Rwanda is under military rule, and there is some unrest and rebel activity in the country. Hartmut is in the process of establishing an antenna farm for his various bands. He now uses on 15 metres a HB9CV beam and, on 20 metres, a two-element counter-fed delta loop. He is now working on a six-element logarithmic Yagi for 10 metres. The antennas are sitting on a 12m elevator tower which gives easy access for maintenance work. Contact with the outside world is with a Yaesu FT757GX, a Ten-Tec Omni V and a FL2100 linear. "The house in which we live," writes Hartmut, "is at an elevation of 1500 metres, and we have a beautiful view of the many hills and mountains which cover Rwanda. This is why it is called "the country of the 1000 hills". Unfortunately, we cannot move around freely any more due to the present civil war. The wonderful Akagera National Park in the east is full of mines, and there is occasional shooting. Our only safe route is to the capital Kigali, which is 11km away. My radio licence and my radio activity are the compensations for our local restrictions," concludes Hartmut in his letter. QSL is either direct: Hartmut Gumpert, BP 420 Kigali, Rwanda, Africa, or to his manager: DJ3FW.

Future DX Activity

* Hong Kong. Phil VS6CT will be on 28480kHz on every Saturday and Sunday from 0000 UTC to 0200 UTC in the month of October to give a new country for those who need Hong Kong on this band.
* Rotuma. Bing VK2BCH went back to his beloved Rotuma Island and was active again as 3D2XV. From there he might go to Funafuti (T2) or to Vanuatu (YJ).
* Mt Athos. Ken VK5QW advises that the monk Apollo SV2ASP/A on Mt Athos, was badly injured in a gas cylinder explosion, and will spend probably two months in hospital.
* Revilla Gigedo. XE2FL will sign as XF4I for three weeks starting 20 October from these IOTA islands (NA-030).
* Pacific. The VE7NH/mm proposed visit to Kingmann Reef (KH5K) and to Palmyra Island (KH5) has been postponed until next year.
* Angola. D2ACA may be active again for a short period beginning mid-September. It is said that the equipment used by the Bulgarian DXpedition was left behind, and they trained a local operator named Miranda. Other sources mentioned LZ2DF and UT3VY as possible operators.
* Mozambique. Ken SM7DZZ is active as C9RZZ on 28022 and on 7001kHz.
* Micronesia. The father and son duo, Dwight V63DJ and Chad V63CJ, will be active from Kosrae Island for two years. Look for them around 14190-14220kHz and at around 0800 to 1100 UTC.
* Vietnam. A six-man team of American operators intends to operate from Saigon (Ho Chi Minh City) during November. They intend to be active on all bands on CW and SSB.

Interesting QSOs and QSL Managers

Note: callsign, name, frequency, mode, UTC, month.

5Z4FO-21023,CW-0530,July. QSL to: KB4EKY Curtis P Wyse, PO Box 248, Waxham, NC 28173 USA.

SV8/DJ4LK-14010-CW-0600. QSL to: Roland Hagmann, St Jakobus Str 6, D-7092, Rosenberg, Germany.

OH0BBF-1400-CW-0530-August. QSL to: Erkki Heikinnen, Myskytie 3, SF-05200, Rajamaki, Finland.

LY91BS-14027-CW-0550-August. QSL to: LY3BS Virgis Matuzevicius Pergales 20, 235300, Panevezys, Lithuania.

9H30Z-14002-CW-0600-August. QSL to: DL1SBR Frank Grossmann, Gottlob Spiesstr 16, D-7123, Sachenheim 1, Germany.

TL8IM Dave-14222-SSB-0615-August. QSL to: AC3D Richard L Gulatsi Jr, 288 Devonshire Road, Devon, PA 19333 USA.

A35IM-14197-SSB-0705-August. QSL to: JA30IN via Bureau.

V63CJ Chad-14224-SSB-1222-August. QSL to: KA3DBN John L Rouse, 2703 Bartlett Ln, Bowie, MD 20715 USA.

KB5TXM/P/KH0 David-21292-SSB-2348-August. QSL to: PO Box 209, Saipan, MP 96950 USA.

6K17WJ Mike-14200-SSB-1103-August. QSL via the HL Bureau.

TG9EO Anibal-14222-SSB-0533-August. QSL to: Anibal Guerra Estrada, Box 10F, Guatemala City, Guatemala.

OY2VO Palle-14190-SSB-0731-August. QSL via the Bureau.

CN12DKH Silvio-14222-SSB-0646-August. QSL to: ARRAM, Box 299, Rabat, Morocco, Africa.

P29PNG George-1422-SSB-0716-August. QSL via the Bureau or PO Box 7089, Goroka, PNG.

HS1CHB John-14182-SSB-1146-August. QSL to: PO Box 1, Bangkok 10900, Thailand.

HI8OMA Oscar-14220-SSB-1049-August. QSL to: PO Box 3272, Santo Domingo, Dominican Republic.

YE0T Han-21205-SSB-0522-September. QSL to: YB0PR Muhammad Faisal Anwar, JI Yahia 1, 61, Jakarta 11540, Indonesia.

RTTY News

Syd VK2SG supplied the following interesting list of RTTY QSOs: HG02JP-14082-1432Z. QSL to: HA0HG * EN50PQ-14088-1544Z. QSL to: UA1ZX * VP2EYF-14085-2233Z. QSL to: KC8JE * EL2FE-14090-2336Z. QSL to: Box 140, Monrovia, Liberia * VK0ZA-14085-1220Z • 3DA0BW-14088-1637Z. QSL to: N5MZH * YS1RS-14089-0509Z. QSL to: Box 792 San Salvador, El Salvador * HZ1AB-14080-1917Z. QSL to: K8PYD * YN1CB-14084-0229Z. QSL to: WX5L * V47RF-14089-0325Z. QSL to: WA2SPL.

From Here and There and Everywhere

* The PY0SK and PY0SR cards, St Peter and St Paul Rocks DXpedition in May, have arrived in Australia courtesy of Austin VK5WO. Austin was one of the direct sponsors of the expedition and has arranged with Karl PS7KM to send to him all the VK QSL cards which did not have sufficient return postage for direct air mailing from Brazil. Karl agreed, and Austin is now in the process of distributing the cards via the local postal system. Thank you Austin in the name of many VKs who needed this card for a new country.
* The Hungarian Amateur Radio Society held its first International Hamfest in the City of Sopron, near the Austrian border. More than 450 radio amateurs attended from most European countries, but there were visitors from the USA and even from Venezuela.

  The special event station VI4HBW made 6692 contacts during the 31 days of operation, with more than 100 different countries. The station received quite a lot of publicity locally and nationally, which augurs well for amateur radio. Incidentally, VI4HBW was not situated on Fraser Island, but in the city of Hervey Bay, about 250km north of Brisbane.
* The latest and final information on the "new" IRCs (International Reply Coupons). Australia Post has now advised all its offices in the Post Office Circular, POC 743, dated August 1991, about the procedure, how to handle the paperwork. The postal employee has to complete return number 330. The type is: General postage. The item code is: G0999, and the value is quoted as $1.20. Just for interest, the full wording in English on the back of the IRC

says: "This coupon is exchangeable in any country of the Universal Postal Union for one or more postage stamps representing the minimum postage for a priority item or an unregistered letter by air to a foreign country." The Australian Post Office sells these coupons at the present for $A1.35. Please make sure when purchasing the coupon that the postal employee date stamps the front of the coupon on the *left-hand side.*

* Received a QSL card with the necessary reply envelope and return postage from Bruce N0ONB. I am now quoting from the letter from Bruce: "I am working on the WAVKCA award and am sorry to say that several VK stations have failed to return a card even though I sent postage. I hope you can find a moment to send me one. I would very much appreciate it." Do you want me to comment? I am ashamed of my VK colleagues who don't QSL. Look up your logs please. Check when you had the contact with Bob N0ONB, dig out his reply envelope from your paper pile and send him his card tomorrow. I have already posted mine.
* Frank VK2QL is not in the best shape these days, and his activity is restricted to about 30 minutes of CW operation per day. Writing about FOC (June *AR)* Frank tells me that he was elected to the First Class CW Operators Club in 1966. Prior to that he became a member of the A1 Operators Club in 1951 and worked more than 190 FOC countries. If you are one of the "oldies" who knows Frank, a few written lines sent to him will not go astray.
* Kiyoko, the Japanese lady with the multitude of Pacific Island callsigns (March 1990 to February 1991) told me that, so far, she sent out more than 30,000 cards to about 12,000 amateurs, but there are still many more cards to attend to.
* Alex 3B8DA informs me that his correct address for QSLs (SAE + return postage for air mail) is: Alex Mootoo, 41 Brown Sequard Ave, Vacoas, Mauritius.
* QSL cards for the recent D2ACA operation must go via LZ2DF and not to the address of the Soviet operators.
* Harry/Herman VK2CCW, also known as DL1RBH, asked me to inform that all QSLs for his last expedition FO0/VK2CCW (July 1991) and 5W1JQ (June 1991) will be sent out during the next two months, as new cards have to be printed as well. Incidentally, the air-mail postage from DL to VK is DM 2:30, which is almost as much as $A2.00.

QSLs Received

Note: W=week; M=month; YR=year; FM=from; MGR=manager and his call; OP=operator and his call.

Direct cards: CP0RCB 94M FM OP), V38PW (6W FM OP), 9Q5TE (5W FM MGR SM0BFJ) PY0SK (3M FM MGR PS7KM), FR5ZU/J (6WQ FM OP = second request). Bureau cards: VK9LF (3YR FM MGR DJ5CQ), AX9LM (3YR FM MGR DJ5CQ), 9N1MM (op Les SP9LJD 1YR FM MGR IK0GRS), 4K0F (1YR 9M from MGR UA0QBO), TI100D (1YR 9M FM MGR TI4SU) 4M5AC (2YR FM MGR YV5AJ).

Thank You

During the two years since I commenced writing this column, I have always been very aware of the goodwill and help of a small circle of amateur radio friends who assisted me in this work. Their letters, notes and comments were always gratefully accepted. I trust you will continue to do so in the future, in your own particular way.

For the assistance received this month I say thank you to the following: VK1ZL, VK2BCH, VK2BEX, VK2DID, VK2DPY, VK2QL, VK2SG, VK4DA, VK4OH, VK5QW, VK5WO, VK5ZN, VK9NS, HA5HR, VE7BS, 9X5HG, and the following publications *QRZ DX, The DX Bulletin* and the *DX News Sheet.*

Good DX and 73. ar

REPEATER LINK

Will McGhie VK6UU @ VK6BBS
21 Waterloo Cr Lesmurdie 6076

Squelch Tails

The receiver sensitivity of your repeater is not the only requirement for readable signals from mobiles and handhelds. Equally important is the performance of the squelch circuit in the repeater's receiver.

The squelch or mute circuit in a repeater is the same as the squelch in your mobile or handheld, but it does one extra task in a repeater. This extra task is to turn on the repeater's transmitter when a signal is detected by the squelch circuit. The squelch in your radio simply turns on the audio amplifier when a signal is received. With the squelch closed the high audio noise level (pink noise) is muted. The reasons why FM receivers have a squelch circuit and AM receivers usually do not is a subject for later discussion.

The difference between a good squelch circuit in a repeater receiver and a poor one can mean the difference between your mobile or handheld signal being readability five and readability one. Mobile signals vary widely in signal strength as received at the repeater's receiver. This signal variation is commonly known as flutter. A good squelch will stay open on a weak fluttery signal with no breaks in the audio and no turning off and on of the repeater's transmitter. Any extra interruptions to the received signal at the repeater only degrade the readability of the signal. A week fluttery signal dropping in and out of the noise is easier to read than one that is being chopped about by the repeater as well.

There is an extra complication with the nature of squelch circuits that are poor in performance. That is the short delay that squelch circuits have in opening, not only in the repeater, but also in your receiver. When a squelch closes on a fluttery signal and then opens on the signal again the opening process is not instant. There is a short delay inherent in the squelch circuit, perhaps only a tenth of a second, but added to this delay is a short delay in turning on the repeater's transmitter again if the repeater's transmitter had dropped out due to the fluttery input signal. To further add to this delay process is the squelch in your receiver having to open again if the repeater's transmitter is turning on and off with the weak incoming signal to the repeater's receiver. The end result of all this is you miss far more of the fluttery signal than you should if the repeater's receiver squelch had stayed open. Sure you would hear a lot of fluttery noise mixed with the wanted audio, but this is much easier to read than a signal being chopped about by the repeater.

A simple solution to stop the repeater squelch from closing too quickly on a fluttery signal is to build in a delay. This delay is inherent in a squelch circuit, anyway, in the form of a capacitor, but is normally short in duration. It is the burst of noise you hear when a signal you are monitoring stops transmitting. Increasing this delay in the repeater's receiver is simple - just increase the value of this capacitor. There is a trade-off however, and that is the burst of noise that is now heard at the end of each over. A fraction of a second is okay, but a second of noise every over becomes annoying.

The solution has been around in some commercial FM radios for several years: a proportional squelch. This clever idea adjusts the length of the squelch tail to suit the received signal strength. Strong signals have almost no squelch tail, and progressively weaker signals longer squelch tails. Up to now I know of no amateur FM receivers to have such a refinement. I also doubt if there are many amateur repeaters that have a proportional squelch.

It is possible to build into your existing repeater a simple proportional squelch that will greatly increase the performance of your repeater's weak signal handling ability. Such a simple circuit has been added to several repeaters in VK6 with excellent results. The squelch was modified so that strong signals have no noise tail, just a faint click on closing,

and weak signals (below half a μV) about half a second.

Provided the squelch in your repeater is sensitive and stable in terms of temperature and supply voltage, the addition of a proportional mute should improve the reception of weak fluttery signals.

Next edition of "Repeater Link" will have detailed information on how to modify your repeater's squelch. Put simply, a second squelch circuit is constructed, the input of which is connected to the high pass output of the audio line. This second squelch is then adjusted to have a sensitivity of about half a microvolt. The output of this second squelch then switches in, on signals below half a microvolt, an extra delay capacitor into the main squelch.

ICs are available that can replace your repeater squelch and provide inbuilt proportional squelch, but this modification requires considerable changes to your repeater.

One final thought on squelch circuits. Most of these circuits have hysteresis, which means a stronger signal is needed to open the squelch than is required to close it. I understand the reasoning behind the idea of hysteresis, but have always found that a repeater receiver works better with little hysteresis. You may find, as I have, that reducing the hysteresis in the squelch circuit results in a better repeater receiver.

ar

SPOTLIGHT ON SWLING

BY ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

The history of the world altered irrevocably on 19 August when there was an attempted coup d'etat in Moscow. The first inkling I had on the radio that something was amiss was the World Services of Radio Moscow suddenly reverting to playing heavy classical music around 0300 UTC. I tuned to the BBC World Service at 0400 for its Newsdesk, and the announcer quoted a TASS report that President Gorbachev had been replaced due to health reasons and that a state of emergency had been declared across the USSR.

I quickly returned to Radio Moscow and there was a female announcer reading out the emergency decree. More heavy classical music followed. The other interesting fact was that all the Russian domestic programming originating from Moscow was carrying a common program, with a similar format to that of the World Service. That is, heavy doses of classical music, interspersed with frequent announcements. However, I found that the BBC World Service had pre-empted its normal programming to concentrate exclusively on the dramatic developments in Moscow. I was, therefore, able to follow what was happening via that station.

I was inwardly kicking myself, as I had done one term in Russian at the Adult Education, but had not gone ahead with it, concentrating instead on the Novice Class put on by our local WIA branch, which was held on the same night. Whilst attending the class, I met a Soviet exchange teacher who visited Tasmania. She gave the class a valuable insight into what was happening within the Russian Federation. The domestic economy had virtually ground to a halt and most blamed Gorbachev. So I wasn't surprised that there was a reaction.

That night, I found the TASS newsagency had reactivated its RTTY feeder on 14700kHz LSB on 425/50R. The copy was 14 pages in length and consisted of a translation of the state of emergency decree and the justification for it. I fully expected the reimposition of the jammers to block out Western broadcasters, but it never eventuated.

On Tuesday, slowly the normal non-controversial programming was reintroduced to the World Service, but I did note that a few foreign languages seemed to be absent, although the carriers were present. The announcers seemed stilted and confused. One could detect the tension in their voices. By this time, resistance to the coup had intensified dramatically. News of developments within Moscow came primarily from the BBC and nothing from Radio Moscow World Service. But the excellent reports over the ABC Radio from Monica Attard in the turmoil gave more background and detail than many other broadcasters.

On the Wednesday morning, the dramatic events around the Russian parliament close to the American Embassy were brought by the BBC World Service. The TV news showed an Icom transceiver in operation from the Russian parliament building. Later it was confirmed that communication was maintained with Leningrad and other Russian cities around 14175kHz utilising non-amateur callsigns. These were interspersed with relays of Radio Russy - the Yeltsin-controlled station. I personally didn't observe it, yet many VK hams did.

By about 1200 UTC, it was apparent the coup was coming unstuck. The Russian parliament had met in emergency session and Yeltsin announced the coup plotters had fled to one of Moscow's airports, and he had ordered their immediate arrest. Pro-coup troops left the radio stations hurriedly, and other points around the city to barracks. Radio Moscow tentatively started to broadcast foreign reaction to the coup and the decrees from the Russian parliament, asserting Russian sovereignty etc. Around 1500 they broadcast an apology, and stated they were under duress during the coup. By now, Gorbachev had been freed from captivity in the Crimea and the coup was over.

Yet things within the USSR had altered significantly. Clearly the failure of the coup was due to the stiffening resolve of the Russian and other Soviet citizens to be free of the Communist dictatorship. Gorbachev returned but never regained the power and influence he had prior to 19 August. The Communist Party has been banned within the USSR for its complicity in the coup, and the individual republics have asserted their sovereignty, with the majority declaring their independence of the Soviet Union, now practically defunct. The three Baltic republics of Latvia, Lithuania and Estonia have won their independence after 51 years, and have won diplomatic recognition from the international community.

In the days ahead, listening to the radio stations from the various republics will be interesting, and some republics will be establishing their own external services. The dominant Russian Federation has already put Radio Russy on-air 24 hours a day. It is easily heard on 15630 and 15750 USB plus within the normal broadcasting allocations. The "Mayak" program has seemingly disappeared, perhaps forever. Their distinct interval signal of the first few bars of *Moscow Nights* was heard practically around the clock on shortwave.

What of Radio Moscow World Service? Probably it will reflect the Russian Republic's viewpoint and could be interesting in the future. They certainly have lost credibility with their audience, and it may alter or change their format.

Certainly the days ahead will have their trauma for the former Soviet Union, and I'm sure that shortwave will continue to yield its surprises in the future. Until next month, keep listening and good luck! DE VK7RH.

ar

Have you advised DoTC of your new address?

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST BRIGHT 3741

The Copperhead Keyer Paddle

Originally by Charles D Rakes KI5AZ (from 73 *Amateur Radio Today* May 1991)

A few years ago there were a few circuits of this type doing the rounds. I even built one of them and made modifications which consisted of taking out a piece at a time until the thing stopped working, then putting the last piece back in. I seem to remember that I ended up with only two transistors and it still worked!

This circuit was sent to me by Graham Thornton VK3IY a few months ago, so I finally built this one too, and, not only does it work okay, but I have plenty of the ICs which I remember picking up at Ballarat Hamvention by the tubeful. "So, what's this to me," you say. Well I thought it would be a good idea if I could make it easier by supplying some of the parts, seeing that I'll never use the things myself, so I bought a bunch of IC sockets, and 10 meg resistors, because they are not usually in one's junk box, so I can supply the first 28 people with the IC, a socket and 8x10meg resistors, just to make it a bit easier collecting all the bits. So, if you want those parts, just write to me enclosing $5 and I'll post them to you.

The Copperhead Keyer was especially designed for the home project builder who can take advantage of a few simple skills and fabricate a useful piece of equipment for a fraction of the cost of a similar commercial item. If you are a good parts scrounger, you can probably build your own version for less than $10.

The paddles will operate with most commercial and home-constructed electronic keyer circuits using the Curtis chip, including the built-in versions in many current transceivers.

How it Works

Take a look at the keyer's schematic diagram and you'll see just how easily electronics can replace a mechanical design. Also notice that an on/off switch is not used or required because the standby current is so minuscule. The battery could survive in standby for its normal shelf life.I could not measure the standby current with my digital meter, so it is less than one microamp; the current increases to 0.19mA with one transistor switched on, and 0.38mA with both on.

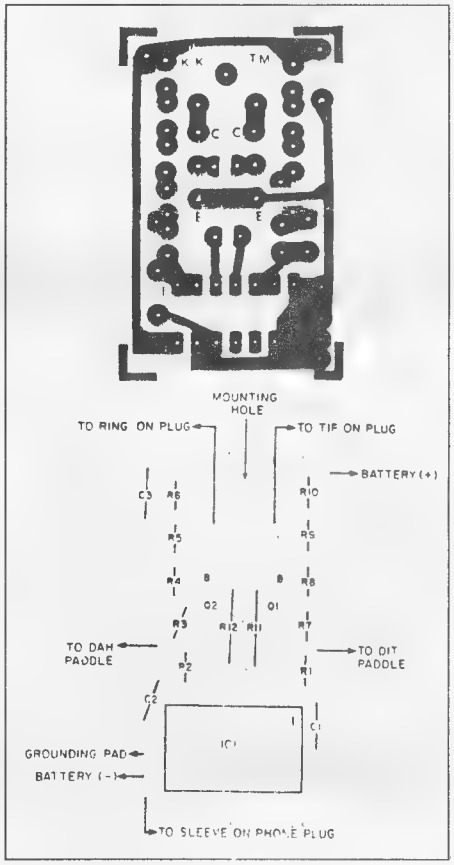
A single 4093 CMOS quad two-input NAND Schmitt trigger IC and two 2N3904 (I used two BC548s) transistors control and direct the circuit's electron flow. The two unused NAND gates are electrically stabilised by tying their gates to earth. The keyed output is fed through a mini or standard quarter-inch phone plug to mate up with the majority of electronic keyers.

The left paddle is connected to the input of gate "A" through a 100k resistor, and back to battery positive through four series 10megohm resistors. The very small current flow through the 40meg resistor string holds the input high. In standby the gate's output, pin #3 is low. When the paddle is bridged, through your skin resistance, to circuit ground, the gate's output goes positive, turning Q1 on. Q1's collector switches any positive load connected to the tip of the phone plug to ground, holding it there until the ground bridge is broken at the paddle. The right paddle operates in a like manner, with Q2 doing the output switching. The inputs of both gates are RF-bypassed with a 39pF capacitor.

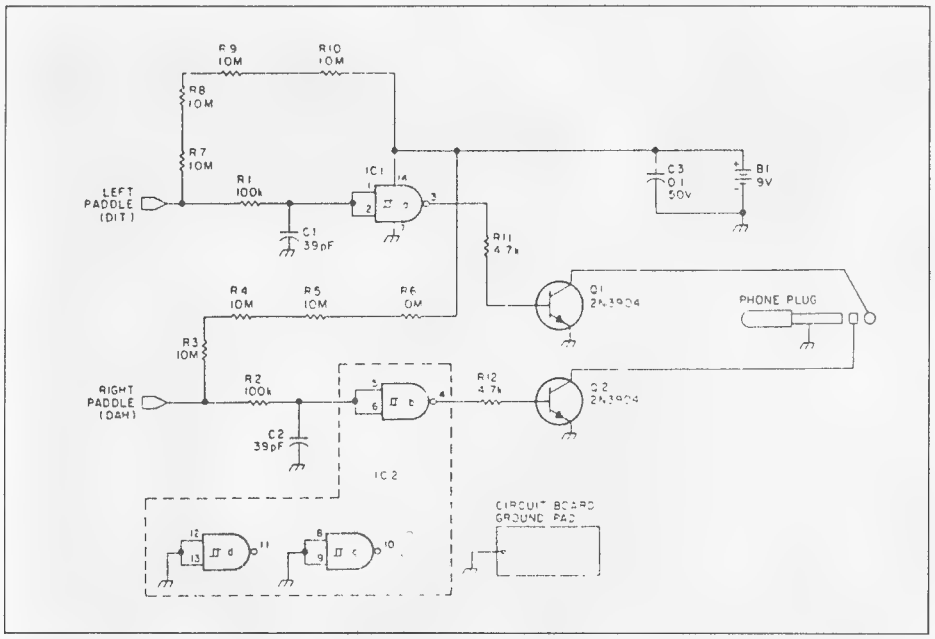
I built my version on a piece of veroboard of 1" by 2", but you may like to use the pattern in the diagram to make a proper board. The article (as received by me) has details for building a paddle using copperclad board, but to save space I have left those details out. You will need to provide a grounded rest for your hand to sit upon so the circuit can ground straight through your hand from the paddle contacts, but otherwise you can design your own paddles. If you have a good idea, write and let me know so we can share it. *(The unique feature of the Copperhead Keyer is the total absence of mechanical action; electrical conductivity provides the keying. - Ed).*

Parts List

B1	9-volt battery
C1, C2	39pF ceramic disc capacitor
C3	0.1µF ceramic disc capacitor
IC-1*	4093 Quad 2-input NAND Schmitt trigger
Q1, Q2	2N3904 NPN transistors (BC548 works too)
R1, R2	100k, quarter-watt resistors



Layout of the Copperhead Keyer - Courtesy 73 magazine.



The Copperhead Keyer circuit - Courtesy 73 Magazine.

R3-R10*	10megohm quarter-watt resistors
R11, R12	4k7 resistors
Phone plug	standard quarter-inch stereo plug
IC socket*	

Items marked "*" available from me for $5 including post and packing.

Did you know, it is possible to solder a three-pin transistor in five wrong ways before getting it right?

Here is a little something downloaded from my local BBS on Packet; there were plenty more, so maybe I'll print one or two each month.

Dear Sirs and Madams

I would never have thought I would have been drawn into this debate about Morse. Having sat for the exam and passed, I would like to see others do the same thing to get the privileges I enjoy, not to lacko out and get them the easy way. What sort of hobby is it if we have to make it easy for those people with no dedication or commitment to get what they want from it?

I say that Morse should be retained for extended or HF privileges, even if it is just to keep wimps off the lower frequencies.

Pin connections on my BC548 transistors (yours could be different).

73s
GIL

WICEN

PETER TYERS VK3KTS
DEPUTY CO-ORDINATOR WICEN GVBR
25 LOTUS CRES MULGRAVE 3170

Great Victorian Bike Ride 1991

Amateurs are invited to participate in the WICEN exercise associated with the 1991 Great Victorian Bike Ride from Stawell to Melbourne.

WICEN has again been asked to provide safety and logistics communications during the period 30 November to 8 December. The route will be from Stawell via Lake Fyans, Dunkeld, Port Fairy, Port Campbell, Apollo Bay and Bacchus Marsh to Melbourne.

A friendly and relaxing atmosphere plus meals, travel allowance and a chance to test and improve your operating skills and equipment are offered to any amateurs who would like to participate.

Should any amateurs care to join in the activity, they should complete both WICEN and Bike Vic registration forms, available from the address given below. In order to meet Bike Victoria requirements, it would be most convenient if this could be done before 30 October. It is planned that mailings of information about routes, accommodation, standing orders will be made to volunteers as soon as possible after that date.

If you have any queries or if you know of anybody who would like to be involved but has not received a registration form, please telephone Ron VK3ECV (050 23 2027, or Peter VK3KTS (03) 541 6794 [BH], (03) 546 4830 [AH].

FOR RON PERRY VK3ECV
RIDE WICEN CO-ORDINATOR

EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

By the time you read this the WIA Exam Service will be ready to accept applications for accreditation as examiners, and will be almost ready to supply examination materials to examiners. Bill Roper has been working long hours and up to seven days a week to ensure the success of the system. Input has been sought and received from a considerable number of persons, both WIA members and non-members, several of whom have also assisted with the preparation of examination materials. The thanks of the WIA go to all these helpers.

This venture of the WIA will be no different from most of the previous ventures. However well prepared and planned, and however successful the final result, the voices that will be first raised and loudest will be those of the "knockers". It is much easier to criticise than construct. Unfortunately, those who are pleased with a system rarely shout their pleasure from the rooftops. They are too busy getting on with the job and making the system work.

The knockers also have very selective memories. This has been instanced most recently by the cries of "Why weren't we consulted?" when the WIA announced the agreement with DoTC to administer examinations. Those who talked of secret deals, takeovers, lack of member input and high-handedness by "the Feds" have conveniently forgotten that in 1986-7 the whole membership was extensively consulted and questioned on its views on devolvement, and that the system which is now being established is the one which was proposed and supported at the 1987 Federal Convention.

There are some points to remember when considering the protocol being established by WIA Exam Service. Although DoTC has devolved the administration of the examinations to the Federal body of the WIA, DoTC is still ultimately responsible for all aspects of all procedures leading to the issuing of the Certificates of Proficiency and Licences. So the WIA Exam Service procedures have had to include the security controls, maintenance of standards and accessibility specified by DoTC. In the resolution of any possible conflicts, DoTC will be the final arbiter. In accepting the responsibility of administering the examinations, the WIA has been motivated solely by its commitment to providing service to present and potential radio amateurs.

I am one who is prepared to "shout from the rooftops" that the new system is going to work, and work well. I have seen much of the hard work that has gone into the planning and preparation, and am confident that Australia will now have an efficient, effective and equitable "user friendly" examination system, run by amateurs for amateurs. This is the biggest task that the Federal body of the WIA has ever taken on. It has the potential to be the biggest boost to amateur radio for years.

Amateur
Radio
Helping
our
Community

ALARA

Dorothy Bishop VK2DDB
153A Galston Rd Hornsby Heights 2077

On Saturday 27 July, VK5 ALARA members helped celebrate ALARA's birthday by operating a special event station, VK5WI, at a Hobbies and Crafts fair. Amateur radio was featured on the stage, and members of the WIA arranged a comprehensive working and static display of all aspects of amateur radio. Denise VK5YL, Meg VK5AOV, Christine VK5CTY, Myrna VK5YW and Paddy VK5ZYB worked shifts, operating on 20m. They wish to thank those who gave them a contact and thereby helped to promote our hobby.

The VK3 members celebrated ALARA's 16th birthday with a luncheon on 28 July. The happy group of nine YLs and three OMs met at the QTH of Raedie. They had a wonderful time talking, laughing and reminiscing. Best wishes were received from our president, Maria VK5BMT/6, and apologies from other members travelling in VK6 and VK8, were read out. It was very funny when the census man came - someone suggested they all sleep there the night.

Thank you Raedie for your hospitality.

Val VK4VR accompanied her OM Brian VK4RX to Melbourne recently. In between the lovely shopping trips and having fun riding on the trains and trams, she met with as many VK3 YLs as possible. She even ventured to Rosebud to visit Bron VK3DYF. Our youngest VK member, Cathleen Walters, lives in VK3 so Val delivered her ALARA badge to her Dad who works in the city. We heard that when the badge arrived home that night, Cathleen's smile stretched from ear to ear. It's her 11th birthday this month. Happy birthday Cathleen!

Christine VK5CTY has a very talented family. Her new son-in-law has just won a trip to France by playing a computer game. It was not just any computer game, it was about marketing strategy, and he is part of a team. In September/October, with wives by their sides, they will be competing against teams from all over the world. We are wondering what the prize will be for the winners of **that** game!

Christine also has a talented daughter-in-law Trish, or maybe Trish's dog is very easy going! Trish decided to take her dog, Toby, to obedience classes to gain CD (companion dog) grading. At the trials, a pass is 170 out of 200, and at Toby's first class he got 192. Naturally, with that score, he came first.

Congratulations to our VK3 YLs who popped over the border to win prizes in the handcraft section at the Adelaide Show. Gwen VK3DYL, Barbara VK3BYK and her daughter Alison almost swept the prize table clean and, from reports I've heard, they really deserved it. I know many of us do handcrafts, knitting etc while playing radio - I was caught mending socks whilst participating in the ALARA contest last year! Thank goodness they are all friends.

Speaking of the ALARA contest, it is on next month so it is time to get the Morse key out and have a little practice. We are really begging for any/every Australian YL (not necessarily an ALARA member) who does not have a full call to try for the Florence McKenzie CW Trophy. Full calls are not "off the hook", you can give the novices and K-calls a contact (and points) on Morse, and OMs can too! Experienced operators would be very happy to slow down or repeat their report if only you'll have a go! Minimum score is 50 points and, with double points for CW, that is very easy to reach.

JOTA will be held on 19 and 20 October so I hope to hear some YL activity. Last year my OM John VK2ZOI helped at one of our local Scout clubs, and during a Wicen exercise last month we were asked why did we favour the Scouts and pay no attention to the Guides. We just did not think; but, on the other hand, they did not approach the radio club either. Anyway, I'll see if I can help them this year. I met some Scout stations in the RD contest and thought that was a great idea for mike practice. In most cases it was not just number crunching, but sharing a little about location and weather.

During November, listen out for five YLs on a YL DXpedition to the British Virgin Islands. The YLs are: Elizabeth VE7YL, Flo KU7F, Mary Lou NM7N, Alice N4DDK and Nellie XE1CI. They plan to be there 11-17 November, then be in Granada for a week from 18

Cathleen Walters, our youngest VK ALARA member.

Norma Watson VK6PNS

Operators at the Hobbies and Craft Fair 27/7/91 (L to R): Denise VK5YL, Meg VK5AOV, Myrna VK5YW and Christine VK5CTY.

November. The islands won't know what hit them! It should be a lot of fun.

We have the results of the 1991 Dutch Midwintercontest, and some of our DX ALARA members did very well. DJ1TE Christa, DL3LG Sigrid and VE7YL Elizabeth were country winners, with Elizabeth also country winner in the CW section. G4EZI Diana and DF2SL Anny, although not country winners, did very well. The next Midwintercontest will be held Saturday and Sunday 11 and 12 January 1992. If you are interested in the rules, please ask our contest manager, Marilyn VK3DMS. This contest is open to OMs too. There is also a special award this year to celebrate the 10th year 88-Award. All that DX YLs need is eight contacts with Dutch YLs. Each contact is worth 11 points, and 88 points are all that are needed. Contacts between 9 May and 31 December 1991 are valid, and a certified log is needed. For further particulars, ask Marilyn VK3DMS.

Maxie DJ4YL is visiting Australia with her sister from 15 September to 30 October. We are not sure if she will take out a VK callsign, but if you hear her on air, please make her welcome.

Welcome to new members Pam VK3EYL who joined at our Dubbo Alarameet, Lyn VK4LLB, Sue VK7NRG, Bev VK4NBC, Robin VK4PRL, Norma VK6PNS, Jennifer VK2NSW and Joy, XYL of VK2EZD. Also welcome back to Judy VK3NYL who we hear regularly on the ALARA net. Just looking at your callsigns prompts me to say - don't forget to try for the Florence McKenzie CW Trophy in our very friendly ALARA Contest!

VK3s (sitting L to R): Raedie Fowler, Jessie VK3VAN, Bron VK3DYF, Robin VK3ENX, Mavis VK3KS, Erika VK3AEB, Muriel May, Phyl VK3KYL and (standing) Gwen VK3DYL.

33/73/88 DOROTHY VK2DDB

mr

FTAC NOTES

JOHN MARTIN VK3ZJC
FTAC CHAIRMAN

New VHF Records

There are five new 6m records this month, three of which are for long path contacts. Long path records have not been accepted in the past, as it was my belief that they were not accepted internationally. However, I stand corrected on this and am happy to confirm these new records:

National Record:	VK3OT	TO	9Q5EE	06/04/91	27186km
VK1 Record:	VK1RX	to	KP4A	08/04/91	16082km
VK2 Record:	VK2BBR	to	6W1QC	02/03/91	21384km
VK4 Record:	VK4ZAZ	to	6W1QC	02/03/91	21741km
Mobile Record:	VK2ZAZ/M	to	FM5WD	06/04/01	16243km

Congratulations to all concerned, especially to Steve VK3OT for his new national record.

50MHz Beacons: Comments PLEASE

Only one response has been received so far to the proposal for 50MHz beacons in the eastern states. This is surprising as I would have thought the issue was an important and pressing one. Time is running short and it is intended to resolve this question at the Federal Council meeting in October.

Briefly, the suggestion is to allot extra frequencies in the DX window, giving preference to frequencies between 50.053 and 50.063MHz. The number of channels available is strictly limited and it is proposed at this stage to limit 50MHz beacons to one each in VK3 and VK7, and two each in VK1/2 and VK4. This means that six channels will be earmarked. One of these is already in use by VK3SIX, and a second has been earmarked for a beacon in the Hobart area which should have begun trial operation by the time you read this.

If there are any objections to this proposal, or any better suggestions, please write. There is no point in waiting until the decision is made and then complaining about it!

mr

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH CO-ORDINATOR
AVIEMORE RUBYVALE 4702

The biggest offender to our band is the USSR, and the offences are primarily from the fixed services, ie military or naval. The traffic is to sea-going vessels, in either the Baltic or northern Pacific. In general, USSR transmitters are notorious for "spurs" and generating third harmonics which far exceed the international agreed standards. USSR transmitters have been estimated to exceed this level by as much as 50 times. They seem to prefer "brute force power" to efficiency; this being so, they must have a bunch of inferior technicians, it seems. How do we remedy this? By getting the SWLs to make negative comments along with their reports? Always tune their signals in from the lower frequency in LSB mode, regardless of the amateur band frequency; this makes it easier to measure the shift on F1B (RTTY), noting that the higher frequency is the "mark".

Remember to leave a three-second break between overs when using a repeater

IARUMS Summary July 1991

Date	Time U/TC	Frequency in MHz 'M' or 'E'	Callsign if Heard	Mode	RST	Logs X	Details of Traffic if Known Any other Information
190791	1035	7008	-	J3E		2	B/C Asian tfc
2707	1316	7012	-	A3E		2	B/c E. Europe or USSR
1207	1225	7013	-	A3E		5	B/C Asian music only
110791	1120	7018		J3E		2	2-way QSO Asian
mni	0001+	14023.5		F1b	S5:9	73	250Hz shift heard 12 hrs
mni	0540+	14045/8		J3e/L	S4	63	Rad tele Asian duplex SSB??
mni	0648+	14058		AC3	S9	65	Fax ch Helschreiber
050791	1030	14070	VNF	A1a	S9	2	Calling VPO & VBX (20obs)
2606+	0855+	14074/5	VRQ	A1a	S9	54	Viet newsagency
1207	1400	14080/5	VRQ	A1a	S5	37	+14200 KFB hrd 11 times on freq
2606+	0800+	14090/8	VPC	A1a	S6	11	Traffic out (fig & ltrs)
2606+	0930+	14100	NZB	A1a	S7	20	also on 14098/104 tfc both ways
2507	2345	14118	????	multi	S9+20	4++	Jammer?? 50Hz solid-NW Brisbane
02+0791	0245	14123	A3j		S9		US, voices talking about oil#
250691	055	14140.5	UMS	F1b	S7	10	250Hz USSR (not hrd much/in our winter mths
mni	1015+	14165	5PP	A1a	S5	6	15min calls FH6 de5PP QRK K
mni	0545+	14170.5	UMS	F1b	S6	61	250Hz USSR Moscow Naval
2706+	mni	14212.5		F1b	S9	27	2ch NOT F7b 1000Hz shift
0107+	mni	14215	HA7	A1a	S7	20	Z5Z de HA7 also uses RTTY
240691	0515+	14217.5	??	F1b	S6	11	Possibly UMS 500Hz hrd 7hrs
0207	2140	14245		A3e	S9		B/cast from Ch
020691	0954	18070		A3j	S6	3	Military, either India/SriLanka
0307	2321	18075		A3e	S5	1	B/cast, possibly Chinese
0407	0200	21032	UMS	F1b	S6	8	Not hrd much in our winter
250691	0600	21115	CQ5	A1a	S6	28	Ltrs, figs
250691	0910	21355	R Mosc	mxd	S6	35	Complex listed as in CHITA USSR

This is a persistent intruder, as are those operatingin the 28-29.7MHz band. Most appear to be either Chinese or Russian origin.

My thanks this month to VKs 2GDF, 3DVT, 4AKX, 4BTW, 4BHJ, 4BXC, 4CAS, 4EKA,5TL, 6RO, 6XW and VK6BWI. Late arrivals will be mentioned in next month's summary.

73, VK4KAL

ar

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. The information given below has been supplied to the WIA free of charge by Thornton Publishing. Your divisional library may have copies of the references quoted.

Amplifiers

More about transistor amps. Peter Phillips, *EA* vol 53 No 8 August 1991 pp 56 - 60. il ccts, diags and graph. An elementary treatment which discusses common collector (emitter follower) transistor circuits and FETS. The various types of MOSFETS are distinguished.

Antennas

Mechanical Details

A Light and Sturdy Quad for 10 and 15 Meters. Kevin Wellenius KA3PDM and Bjorn Wellenius W3/CE3VU, *QST* vol LXXV No 7 July 1991 pp 30 - 32. il diags and photos. A practical construction guide is given using GRP fishing poles as spreaders. Element spacing is 4'8".

Miscellaneous

A Simple, Effective Dual-Band Inverted-L Antenna. Dennis Monticelli AE6C, *QST* vol LXXV No 7 July 1991 pp 38 - 41. il cct, diags and graphs. A design for a low band antenna is given, of total length 3/8 and 3/4λ A simple ATU is described to match the antenna to 50Ω.

Feeding Dipole Antennas. James W ('Rus') Healy NJ2L, *QST* vol LXXV No 7 July 1991 pp 22 - 24. il photos. A general dissertation on methods of feeding dipole antennas is given, including consideration of open wire lines and coaxial cable. Three designs of coaxial choke-baluns for eliminating coaxial outer currents are described.

Top Band - A Challenge. Peter Botha ZS4PB, *RadZS* vol 45 No 6 June 1991 p 6. il diags. A brief dissertation on four different antenna systems for use on 160m is given.

160-Meter Antennas. John S Belrose VE2CV, *QST* (Technical Correspondence) vol LXXV No 7 July 1001 pp 49 - 50. il diag and graphs. Azimuthal and vertical polar diagrams are presented and discussed for two inverted-L and one T antenna.

Multiband

The Megaloop. Stan Gibilsco W1GV, *73* issue #370 July 1991 pp 29 - 30, 44. il diags. A report on experiments with a long wire 880 feet long, and a 3600 foot horizontal loop is given. Such antennas are frequency insensitive. One virtue claimed is freedom from fading, due to the large area occupied by the antenna.

VHF/UHF

Antennas by the Yard. Ruston Cable WA6TLK, *73* issue #370 July 1991 pp 22, 24. il photos. A length of steel tape measure is used as a flexible and more efficient antenna than a rubber ducky. Detailed construction information is included.

Build a Portable Ground Plane Antenna. Zack Lau KH6CP/1, *QST* vol LXXV No 7 July 1991 pp 33 - 34. il photos. Details for the construction of a ground plane antenna for 146, 223 and 440 MHz are given. The design

is intended to improve the performance of hand held transceivers which normally use a rubber ducky.

Amateur Television

Micro ATV Transmitter. Mike Henkoski KC6CCC, *73* issue #370 July 1991 pp 9 - 10, 12. il cct, cmps, pcbs and photos. A 100mW 434 MHz video transmitter is described. The unit is based on a Surface Acoustic Wave monolithic oscillator supplied by RF Monolithics Inc of Dallas Texas. SMD technology is used in the construction. Suggested applications include remote control model aircraft TV and a 'Lookie-talkie'.

SSTV with the Robot 1200C Scan Converter and the Martin Emmerson EPROM Version 4.0. (Product Review) Dick Goodman WA3USG, *73* issue #370 July 1991 pp 46 - 48. il photos. A review of the performance of Robot 1200C, manufactured by Robot Research of San Diego California, when modified by a Martin Emmerson EPROM Ver 4.0 is presented. The Eprom is manufactured by Martin Emmerson G3OQD of Hayes, Bromley, Kent.

The ATV-3 Downconverter. Dave Pelaez AH2AR/8, *73* issue #370 July 1991 p 50. A description of the assembly and operation of a kit manufactured by Communication Concepts Inc Xenia Ohio is given. The unit is inserted between a 70 cm antenna and a TV set. It can tune the entire 70 cm ATV band.

The VOR-2 Video Operated Relay. (Product Review) Dick Goodman WA3USG, *73* issue #370 July 1991 pp 26, 28. il photo. A review of a video operated relay board manufactured by PC Electronics of Arcadia California. The device is used as a carrier operated switch for ATV repeaters.

Computers

Hardware

Improved Serial I/O Interface for PCs - 2. Jim Rowe VK2ZLO, *EA* vol 53 No 8 Aug 1991 pp 82 - 84, 110. il ccts, cmps, diag, pcbs and photos. This concluding part of the article describes in detail the design of opto-isolator input buffers, relay output driver circuits and triac output drivers. Software programs are included for testing the system and for simple applications.

Software

Software for the Hamshack, Part III. Bill Clarke WA4BLC *73* issue #370 July 1991 pp 42, 44. This part adds programs to calculate radio distance to the horizon for a given antenna height, and to portray colour codes for a selected resistor.

Electronic Devices

Audio Alarms

Experimenting with Electronics 1 - Simple Siren. Peter Murtagh, *EA* vol 53 No 8 Aug 1991 pp 103 - 105. cct, cmp, pcb and photo. A simple two transistor circuit acts as a wailer, which can be adjusted to sound like an air-raid siren or a police siren.

Automotive

Hall Effect Speed Sensor. Jeff Monegal, *EA* vol 53 No 8 August 1991 pp 62 - 64. il cct, diag, graph, pcb and photo. A Hall effect sensor is used to measure the rotational speed of an automotive tailshaft, as an alternative to the pick-up coil previously described by the same author. The magnets are mounted diametrically opposite on the tailshaft with reverse polarity. The circuit output provides a series of positive spikes, whose rate is proportional to the vehicle speed.

Programmable Trip Meter. Jeff Monegal, *EA* vol 53 No 8 Aug 1991 pp 94 - 99, 107. il ccts, cmps, diags and photos. The construction details are given for a device which gives a digital display of distance covered, analogous to an odometer. However, this equipment can be set to show the distance remaining as well as the distance travelled.

Telephone Accessories

A Practical and Versatile DTMF Decoder (2). Farrell Segall ZS6RW, *RadZS* vol 45 No 6 June 1991 pp 10 - 12. il cct. The complete circuit is described for a unit which can identify and act on any of 16 two-tone combinations. Either relays or opto-isolated transistors can be used to actuate up to 6 output devices.

Narrow Band Modes

AMTOR Primer. Floyd Stamm ZS5QQ, *RadZS* vol 45 No 6 June 1991 pp 8, 24 - 25. An elementary description of the AMTOR system is given. Most packet TNCs and computer software can be used to handle AMTOR.

Propagation

Tropo Time is Now! Gordon West WB6NOA, *73* issue #370 July 1991 pp 14, 18, 20. il photos. A general discussion is given on the phenomenon of tropospheric ducting. Emphasis is given to the California-Hawaii duct.

Power Supplies

DC-DC Converters

Secrets of Simple DC-DC Converters - 1. Andrew Pierson, *EA* vol 53 No 8 Aug 1991 pp 134 - 136. il cct and graphs. A background analysis is given for the design of blocking oscillators to generate an AC output, prior to rectification and filtering. The criteria for regulation of such a power supply are introduced.

Miscellaneous

Choosing The Right RCD. Peter Foley, *EA* vol 53 No 8 Aug 1991 pp 120 - 122. il ccts, diags, graph and photos. A general discussion is given on the techniques used for commercial models of Residual Current Devices (Earth Leakage Protectors). Both electro-mechanical and electronic devices are described.

Series Regulated

Low Cost 18V/1A Benchtop Supply. Rob Evans, *EA* vol 53 No 8 August 1991 pp 72 - 78. il cct, cmp, diags, graph, pcb and photos. Based on a 723 IC regulator, a complete design is presented which will supply 2.5 - 18V regulated at up to 1 amp load. The load regulation is better than 0.15% at 1A. Line regulation is better than 0.1% between 210 - 260V AC input. The output ripple is less than 1mV at full current output. A current limit is incorporated, which may be switched to either 30mA or 1.2A.

Technology

An Introduction to Digital Signal Processing. Bruce S Hale KB1MW/7, *QST* vol LXXV No 7 July 1991 pp 35 - 37. il cct and graphs. A basic description of Digital Signal Processing is given. Applications such as filtering and the recovery of signal from noise are discussed.

Lightning Protection. Frank A Finger NU1A, *73* issue #370 July 1991 p 32. A general discussion is given on the measures which can be taken to reduce the effect of lightning on antennas and equipment. Emphasis is placed on the value of a sharp pointed rod to discharge an antenna at low voltage.

Transceivers

Microwave

A Single-Board, No-Tune 902-MHz Transverter. Rick Campbell KK7B, *QST* vol LXXV No 7 July 1991 pp 25 - 29. il ccts, cmp, graph and photo. A design is presented for a 902 MHz transverter for use with a 2m rig. Printed band-pass filters are used, with Monolithic Microwave Integrated Circuits.

Product Reviews

Kenwood TS-850S 160 - 10 Meter Transceiver. James W ('Rus') Healy NJ2L, *QST* vol LXXV No 7 July 1991 pp 42 - 46. il graphs and photos. A detailed report is presented; measurements are compared to specifications.

Transmitters

A Different Weave of SSB Exciter. Peter Traneus Anderson KC1HR; *QEX* No 114 Aug 1991 pp 3 - 9. il ccts and graphs. A design for a 75m SSB exciter is given which uses the Weaver method of SSB generation by phasing; a general theoretical discussion precedes the specific design details.

With the Weaver method, both the suppressed carrier and the unwanted sideband signal fall within the desired passband, eliminating spurious emissions. The unwanted signals require less attenuation for satisfactory communication than other methods of SSB generation. It is claimed that modern components, such as switched capacitor filters, now make this approach to SSB generation

more practical.

Glossary of Abbreviations

il The article contains illustrations, a list of which follows.

cct A circuit diagram

cmp A component layout drawing

EA Electronics Australia

diag A mechanical drawing

pcb A master drawing from which printed circuits may be produced

QSTVE QST Canada

RadCom Radio Communication

RadZS Radio ZS

73 73 Amateur Radio Today

The above items are reproduced from *Amateur Radio Technical Abstracts* Volume 1 1991 ISSN 1036-3025 - to be published.

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DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

New Callbook

The 1991/92 edition will now be available from the Divisional office. Listen to the VK2WI broadcasts for details of member costs and postage. A reminder to clubs that you should make a bulk purchase from the office as a service to your local amateurs. Call the office on (02) 689 2417 12 noon to 1pm weekdays, fax any time (02) 633 1525 or write to PO Box 1066, Parramatta NSW 2124. Cheque or credit card payment. Don't forget that the office also maintains a range of publications from various sources. Now is the time to submit advance orders for next year's *ARRL Handbook* or the international or American callbooks.

The last Trash and Treasure for this year will be on Sunday afternoon, 24 November. It should be noted that items available from the Division at a T&T are not available outside these days. The office receives enquiries after a T&T for some things known to be left. The office staff cannot assist on these lines. The only non-publication lines available from the office are the grab bag series and, sometimes, small components. Trash and Treasures are held at Parramatta in the car park on the last Sunday of the odd-numbered month unless that day is in the middle of a long weekend. As always, the broadcasts will advise.

All 2m Alinco handhelds went in the recent ballot and have now been distributed.

New Members

The following joined the Division during August, and a warm welcome is extended to them.

P	Body	Assoc	Baulkham Hills
S G	Brown	VK2NNB	Hazelbrook
H	DeArmas	Assoc	Guildford
M K	Dudzik	Assoc	Prospect
C	Sara	Assoc	Galston
B	Seymour	VK2PAC	Tumbarumba
M W	Soire	Assoc	Pyrmont
A P	Syuko	Assoc	Seven Hills

5/8 WAVE

ROWLAND BRUCE VK5OU

Once again you have a "President's Report" as Jenny is still overseas at the time of writing. However, she will be back to read this October *AR*. We hope you had a good trip, and all of us look forward to reading your usual column again. Especially me. I don't know how you do it month after month. You obviously have a journalistic flair!

October is the month for JOTA, of course. This year the "Life. Be In It!" event will be held in Bonython Park, and the recently formed North East Radio Group will be operating a station there. I'm sure they would welcome any offers of assistance. Alan VK5ZN and I are planning a visit to them in September as part of the council's policy of getting out to affiliated clubs. We appreciate the invitations, and between us hope that even most remote will see somebody, even if it is only when a council member is in the area on business. I must say, though, that it will probably be next May or June before anyone gets to Alice Springs.

It is probably not too late either for anyone wanting to assist Chuck VK5CQ with the Camp Quality station or with the technology sessions with the campers to give Charles Waite a ring on (08) 414 0105 (that's a pager service, so you will have to ask for Charles, not Chuck!) or Kevin Johnson on (08) 230 9612 (work) to arrange the best time. The dates are 30 September to 4 October inclusive.

Quite a number of people are sitting exams lately. Please note the following amended dates for the rest of 1991 and let anyone you know to be planning to sit them as they probably will not routinely see *AR*.

26 October, 1pm ,WIA SA Division, phone 276 1251

16 November, 10am, Christine Taylor, phone 293 5615

7 December, 1pm, AHARS, phone 276 7091

Also, for the Constructors, the October WIA meeting will be the Members' Equipment night.

And now, an attempt to thank those who did such a good job at the Hobby Fair. First and foremost must come the President of ACBRO, Trevor, and VK5PRM Peter, who supported and arranged the display. Neville VK5XD and Grant VK5ZWI, ALARA - especially Meg and Christine - Southern Cross DX Club, ACBRO itself and the SA ATV Group put in vast amounts of time, and Peter Koen produced his usual excellent display stand. Thank you all, and thank you also to those I have not mentioned by name. I'm sure there will be many of you. Please do not think you are not appreciated, you are! It's just that my memory is not all it should be.

VK6 NOTES

HARRY ATKINSON VK6WZ

Accident insurance for WA Division members whenever engaged in volunteer duties for the Division or for an affiliated club has been secured.

Following several months of discussion and delays, the cover was obtained for accident insurance and also for public risk up to $5,000,000, mainly through the efforts of Trish VK6QL. All this sprang from a renewal notice from the Institute's previous insurers demanding a premium jump from around $800 per annum to $1500 - and, at that, for a less attractive cover.

Council set a budget figure of $1000, plus or minus, and the ultimate deal was settled at 1100 - in the circumstances a satisfactory figure.

Quietly, and with no fuss at all, history has been made in the ranks of the VK6 Morse practice volunteers. For years a totally male preserve, this valuable service now enjoys the presence of a lady, Dianne VK6BC. It would take a good deal of research to list all those amateurs who have benefited from the VK6WIA nightly practice, and who have later volunteered as operators on the roster, and in at least one instance become the "boss man" - the Morse Co-ordinator. It's called giving something back, and is one of the best things that can happen in radio or in any human endeavour. Thank you, Dianne - and thank you gentlemen!

ar

Support the WIA in order to protect amateur radio frequencies at WARC-92

CLUB CORNER

Air Forces Amateur Radio Net

With permission of the Gold Coast Amateur Radio Society Inc, the Air Forces Amateur Radio Net is holding its Annual Meeting at the gold Coast Hamfest on 9 November.

Registration of members and visitors will be between the hours of 10am ad noon in the foyer of the hamfest and, after a lunch at Jupiter's Casino, the Annual Meeting will be held in the Conference Room above the Hamfest.

BOB NEVILLE VK4ACL, SECRETARY
AFAR NET
124 ROSCOMMON ROAD
BOONDALL 4034

Moorabbin & District Radio Club

Please note that the Moorabbin and District Radio Club has decided to change its meeting nights, effective October.

Beginning on Friday 18 October, the regular monthly general meeting will take place on the third Friday of the month, and the natter night on the first Friday of the month.

The September meeting will be on Friday 6 September as previously arranged. Natter nights will be on 20 September and 4 October.

ALLAN DOBLE VK3AMD
PUBLICITY OFFICER

Riverland Radio Club

Riverland features in variety club "bash".

At the annual general meeting of the Riverland Amateur Radio Club on 6 June, three retiring members of the committee were re-elected; they were Peter Blades VK5APB, Kingsley Brauer VK5NOU and Doug Tamblyn VK5PDT. Kingsley was re-elected vice president, and Doug re-elected secretary. Adrian Reiman VK5AB was also elected to the committee.

Congratulations to Mike MacIntosh VK5CK on obtaining his full call. Mike was elated when he found out the callsign VK5CK was available.

The callsign holds some significance for Mike because, for some years, he was employed with the ABC radio station 5CK at Port Pirie (SA). Congratulations Mike.

The club has also recently installed six new cavity filters at the 2m voice repeater VK5RLD at Berri, increasing the output by about 1dB.

The Riverland featured in this year's Clipsal SA Variety Club "bush bash" with more than 100 pre-1966 vehicles crossing the finish line at Renmark on Friday afternoon 23 August, after starting at Glenelg on 17 August, then travelling some 3273km through some of the roughest outback roads of the north of SA, NSW and Vic.

A very large crowd of enthusiastic people was there to greet them, especially car 33 - the only Riverland entrant - driven by Barry Fletcher, Chris Vanderwoude and Ivan Smith VK5PAW. Ivan has now been involved in two Variety bush bashes, and each time he has enthusiastically promoted amateur radio. While mobile in the outback of SA, Ivan made contact with a station in Papua New Guinea.

The bash raised a total of $600,000 for disadvantaged and needy children of SA.

The Renmark and Paringa District Hospital received $26,000 for the ear, nose and throat wing of the children's section of the hospital.

The principal of the Riverland Special School at Berri was also presented with a set of keys to a 12-passenger bus, at a dinner in the sport and recreation centre at Renmark on Saturday 24 August, which was attended by 700 people. The Riverland received $56,000 in total.

The Riverland entrant in this year's Clipsal SA Variety Club "Bush Bash". L to R: Chris Vanderwoude, Ivan Smith VK5PAW and Barry Fletcher at the start of the bash at Glenelg.

Gold Coast

The Gold Coast Amateur Radio Society Inc is holding its 14th annual Hamfest in the Albert Waterways Community Centre, Mermaid Waters (just south of Jupiter's Casino) on 9 November 1991.

Doors will be open from 9am-4pm.

Commercial displays, interest groups and the popular bring-and-buy sections will be complemented by door prizes, raffles and refreshments to make this an enjoyable day to catch up with other amateurs.

This year the Air Forces Amateur Radio Net will be holding its Annual General Meeting in the conference room at the Hamfest, so a warm welcome is extended to all ex-service persons to attend this function.

ED NEWMAN VK4JEN
SECRETARY
PO BOX 588
SOUTHPORT 4215

Ballarat Amateur Radio Group Hamvention

The Ballarat Amateur Radio Group will hold its annual Hamvention on Sunday 27 October 1991.

This year's venue will be at the Bray Raceway Trotting Track in Bell St, Ballarat, 3km south from the city centre off Skipton St. This year's huge venue is all under cover for displays and car-boot sales, with no space problems. Book your table early to sell your surplus gear.

A full day's entertainment is assured with all the usual displays and fox hunt events, along with a barbecue lunch, free tea and coffee all day, all for $10 per person, children free. On Sunday morning there will be trotting trials at the venue also at no extra cost.

Book your selling space now. Trestles will cost $10, boot sales $5. Make it a great family day. channel 3 (146.750) repeater will be used to help you locate the venue.

For further details or to book space, phone Kevin Σ VK3WN on (053) 35 5011. QTHR.

nr

Radio Amateurs Old Timers Club

The RAOTC will hold a luncheon, including election of committee, at Bentleigh Club on Wednesday 9 October at 12.30 for 1pm. Cost is $20 per head plus liquid refreshments. Bentleigh Club is located in Yawla St, Bentleigh; Melway's map reference 68 B11.
Allan Doble VK3AMD

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

Used Satellite Salesmen

I suppose it had to happen, but I think the evidence is there to show them at work.

May 1991 *AR* p40 lists AO-10 with 5855 orbits on the clock. Three months later, August 1991, p35 lists it with 3234 orbits. Yes, they have started to wind back the odomoter even on satellites.

What does it mean for amateur radio?

DENNIS AVARD VK4ADY
11 JAMES ST LAIDLEY 4341

(Incredible, isn't it, Dennis? I'm sure our satellite experts will be able to find the explanation now they've been shown the problem. Ed)

Recession Victim

My request, although unusual, is genuine. I am seeking to relocate to anywhere(!) including NZ, South Pacific, VK1-8, in order to find suitable employment.

I am a qualified tertiary/TAFE teacher of many years experience, currently employed as an Adult Literacy/Numeracy teacher for Skillshare and LifeSkills lecturer for TAFE here in Whyalla. Full-time, permanent appointments no longer exist in VK5, so I seek some elsewhere. I have no ties and will supply CV, resume, qualifications (PhD, MSc, BSc, Grad Dip Ed and Grad Cert in Aboriginal Studies) and references to any interested parties. Our journal is widely read and my enquiry may lead me to pastures new. Keep up the good work.

DAVID ("DOC") WESCOMBE-DOWN
VK5HP
C/- WHYALLA ARC
PO BOX 444
WHYALLA 5600

PS: I also collect stamps - can you help my collection?

Help Wanted

May I ask (through your pages) for help from other amateurs on a few problems.

1. I need a cure for an annoying wobble in the VFO in my QRP rig, an FT-77S. If the RIT is not on, the frequency can wobble up and down by a couple of hundred Hertz. The central frequency remains as per the dial, but at times the wobble is almost continuous. At other times, the wobbles may not appear for hours.
   Curiously, turning the RIT on causes the wobble to disappear! I feel this may not be a problem in my rig alone. Has anyone else experienced this condition?
2. I need advice about suitable brands of finals for my QRO rig, an FT-102. In Australia, only one or two brands of finals are available, viz GE and Penta. Have any other amateurs used these with success in this rig?
3. I have a home brew 30 amp power supply, which has just developed an annoying audio HUMMMM! I have checked all the usual possibilities, with no real improvement. I suspect that the transformer coils may be vibrating slightly. Has anyone got ideas (other than Araldite!) for curing this annoying noise?

If anyone can help me with these three "problems", I would appreciate a line to the address below. I am not QTHR in the 1991 callbook. I would acknowledge any replies.

RICHARD JENKINS VK1RJ
PO BOX 101 CHARNWOOD ACT 2615

Misunderstanding

(also direct to Doug VK4AVR)

I have just received my copy of September *AR* and was dismayed to read your letter concerning skydivers and the interpretation you had put on a few words. I believe you have taken them out of context.

In no way was the comment a cheap shot at skydivers. I have the highest admiration for them and the care and diligence which they apply to training and caring for their equipment. This includes the fastidious way in which they pack their chutes as, of course, their lives depend on the chute functioning correctly.

If you look closely at the photo you will see that the "chute" used on the payload was tied immediately under the balloons and was not packed. This was the basis of my reference to skydivers and, as previously stated, was not meant to be in any way disrespectful to them. I enjoy watching skydivers perform, and if I had a bit more courage I might be inclined to have a go too. Needless to say, my wife does not share my interest in such things. I have flown in planes with skydivers, so am not unfamiliar with their professional dedication to the sport.

Please convey to those few skydivers you spoke to the real reason for my comments. Perhaps I need next time to be more careful with my choice of words. I certainly didn't set out to offend anyone when I wrote the article.

GEOFF ATKINSON VK3YFA
31 BERRINGA RD NTH RINGWOOD 3134.

Operators Needed

At the end of this year the Scout Association of Australia, Victorian Branch, is hosting the 16th Australian Jamboree at Victoria Park, Ballarat. An amateur radio station is to be set up on site to enable the citizens of the tent city to have an opportunity to see how a radio station works outside of the normal JOTA set-up.

Also Jamborees traditionally have visitors from overseas who arrange schedules back to their home country.

Victoria Park, Ballarat, has been chosen to be the home of over 12,000 people living in a tent city between 2-14 January 1992. Planning is well under way both for feeding and entertaining the Scouts.

But, to run the radio station, operators are required.

I have been asked by the co-ordinator of the amateur radio station to approach the WIA and various radio clubs to gain assistance in running this station.

I am involved in the Scout Radio and Electronic Service Unit and an active member of the Scout Association as an Assistant Cub Scout Leader.

I hope the readers of *Amateur Radio* may be able to help.

I can be contacted by any of the means listed below.

KENT COCHRAN VK3TER
3/556 MORELAND RD WEST BRUNSWICK 3055
(PHONE 384 1610 HOME, 387 5490 WORK, 399 1184 FAX).

We are All Being Counted

Geoff VK2SA and his wife Maralyn were travelling over the Simpson Desert accompanied by four others on a four-wheel-drive holiday.

On 6 and 7 August they were at Dalhousie Springs, which is about 300 miles east of Oodnadatta. It is a beautiful area, with palm trees, hot springs and a fine climate - temperature 35 deg.

Imagine relaxing, miles away from anywhere, no phone, no work etc.

A small speck was seen in the sky. It grew bigger - obviously an aircraft, which landed nearby. Out jumped the pilot and came up to the group to announce that he was doing the census and had the forms for them to fill in.

After waiting for them to do so, he thanked them, bid them g'day ad took off.

Is there anywhere to hide?

PETER CORKERON VK2AGB
3 PRIMROSE PLACE LOTFUT 2232

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr L B J Sutton	L40263
Mr C A Davey	VK3WT
Mr W M Nicholson	VK3AJG
Mr G H Whitehead	VK4NYE
Mr S W D Wilson	VK5ASD
Mr M Bottomley	VK6AML

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For LF/HF/VHF/UHF applications. Send DL size SASE for data/price to RJ & US Imports, Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave, Kiama). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Electronic Components, ACT; Truscott Electronics, Melbourne.

● LOGMASTER: Radio logkeeping software $89. CODEMASTER Morse training/proficiency software $49, endorsed by Officers of Signals Schools of Aust Army. Both products include manuals for IBM/clones PC, XT, AT Information Order. Milestone Technologies P/L PO Box 699 Mt Waverley, Victoria, Australia 3149. Ph (03) 807 6767. 8 Greenham Cres, Mt Waverley 3149.

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high-resolution short-wave weatherfax, Morse & RTTY receiving program. Needs CGA, SSBhf radio & Radfax decoder. Also RF2HERC, RF2EGA & RF2VGA, same as RADFAX2, but suitable for Hercules, EGA & VGA cards respectively $35. SATFAX is a NOAA, Meteor and GMS weather satellite picture receiving program, uses EGA or VGA modes. Needs EGA or VGA colour monitor and card and WEATHER fax PC card & 137MHz receiver $45. All programs are on 5.25 inch or 3.5 inch disks (state which) and documentation. Add $3 postage. ONLY from M Delahunty, 42 Villiers St, New Farm, Qld 4005. Ph: (07) 358 2785.

FOR SALE - NSW

● KENWOOD SPEAKER/MICROPHONE SMC-32, never been used. Fits TH-26A and TH-46A. But NOT TR2500 etc. $25. Ph (066) 52 6135 VK2AWA. QTHR.

● KENWOOD SM220 with BS8 option, $300. AT200 $100. MC50 $50. RD300 dummy load $30. Drake TV3300LP low pass filter $20. All PC. Ian VK2CJP QTHR. Ph (02) 44 4985.

● HYGAIN TH3J tribander 20/15/10 3el beam, new, never assembled, $250. Rotator Emotator 103LBX 240 vac new, never used, $250. Craig VK2ACH QTHR. Ph (049) 43 5431.

● CUBICAL QUAD homebrew, two-element duo band 10 and 15m $100. Steve VK2STV (02) 602 2085 QTHR. care VK2MSA.

● ICOM IC-781 Multi function CRT display HF all mode transceiver. Quadruple conversion receiver, 105dB dynamic range, inbuilt ATU and power supply, 150W output and much more. Sacrifice $7500. Genuine buyers only please. John VK2ATU (02) 792 2275.

● FTDX560 YAESU VGC $350. Chrnside duoband beam 15-10m $150. Home-brew linear part wired 4/830s 1.5kW pep $180. VK20C (069) 48 5267 AH.

● CRYSTAL SUIT 6M/7MHz converter type D 45.1MHz miniature HC25 45.000MHz $12 ea incl post. VK2KSD QTHR.

● YAESU FT207R synthesised 2m handheld (SN: OK120469) with carry case, charger, speaker/mike YM-24A) to suit and 13.V car adapter PA-2) $380. Kenwood TM401A 70cm mobile (SN: 4022060) $380. Apollo UHF CB with mike $300. Apple clone computer "Supercom" with serial and parallel cards, 80 column card, separate keyboard, twin 5-inch drives etc. $300. Noel VK2YXM QTHR. Ph (02) 871 3079.

● SIERRA bi-directional power monitor less plug-in $90. Waveguide attenuator 0-40dB $30. Composite video monitor green screen $40. Two AN/USM105A dual trace oscilloscopes with handbook $100. John (02) 417 5338. 68 Warrane Rd, Willoughby 2068.

● ICOM IC202 with IC3PS power supply and IC20L 10W PEP amplifier satellite xtals fitted and manuals. SN: 22177 $200. Nick VK2AOR QTHR.

FOR SALE - VIC

● AWA FM MARINE hi-hand transceiver (faulty power supply) all valve circuit (comes with tune-up details and circuit diagram). No crystals supplied suitable for 2m FM conversion $30 ono. Vincent VK3AJO QTHR. Ph (03) 872 3503.

● RX R5223 General coverage $100. RX AR7 in pieces, all parts available. Includes 4 coil boxes $100. AWA 50W base station 640 final $50. Vinten MTR 20 mobile 12V complete and works $30. Vinten MTR 13 mobile 12V complete with AC PS $40. Plus freight. Offers may be considered. Contact Neil (053) 459 6445.

● STC MTR 151 hi-band VHF transceiver fully transistorised 10 channs xtal controlled, includes tune-up manual and cct diag etc $35 ono. Needs crystals plus new PA transistors. Vincent VK3AJO QTHR. Ph (03) 872 3503.

● GENERAL ELECTRONICS 600L Linear. No tune. 160, 80, 40, 20, 15, 10. SN: 56356 spare 813 final. Cash and carry $200. Werner Wulf 10Mx 3 element beam. Unused $90. Gil VK3AUI QTHR. Ph (03) 808 2794.

● IBM XTclone 10meg with 5-1/4 drive and 20 meg hard drive 2S/2P/G herc card and monitor $800 ono. Gil VK3CQ QTHR. Ph (057) 55 1158 BH or (057) 55 1124 AH.

● QUAD ANTENNA 20m monobander, aluminium spreaders, cast aluminium hubs, 3m boom wire and insulators $100. VK3AUC (03) 589 2470.

● YAESU FT757MK1 Mic & manual $1000. Kenwood TR9130 2m all mode 25W $500. Kenwood TR9500 70cm all mode 10W $550. Kenwood TS660 quadbander all mode 21, 24, 28 & 50MHz $600. Two National WV-303ON colour video cameras with P/s & manuals $150 ea. Pioneer PC PX-7 MSX computer with manuals $100. TV sync pulse gen equipment, colour PG05 system Astor with h'book $100. Riker Video indust syn gen & 1501 Video test set (ex Ch0) B/W. With manuals $100. Reel-to-reel TEAC A3440 4ch multi-track tape deck with simul-sync $500. VK3CSJ (03) 792 4500.

● HF ALL BAND hi pwr linear amp, beautifully built 3X811As in GG best offer to $550. Matching 5-band hybrid 100W PEP transmitter VFO control, best offer to $300. Sweep & Marker generator plus circuit & instructions $75. 13.8V (variable) 20A 240V AC commercial power supply, $150 inc manual. VK3ADI QTHR.AH Ph (03) 882 0020 BH.

● YAESU FT757GX S/N: 4L133092 all mode all band keyer CW filter IF shift-width etc, mic, manuals EC $875. Antenna TET-Emtron triband-wideband, part assembled, manual, GC $300. Ex QTH. VK3UJ NOT QTHR. Ph (03) 726 8879.

● LOG PERIOD Antenna 13-30-8 all bands 10-20m with 2kW balun. Rotator Kenpro KR2000RC brake torque 10,000 kgcm with wedge brake. Both GC. Antenna $450. Rotator cost $1350, sell $600. Morrison VK3BCY QTHR. Ph (056) 89 1205 (03) 877 2597.

● LOTS OF PRE-LOVED EQUIPMENT at the Ballarat Hamvention Sunday 27 October at the Bray Raceway Trotting Track, Bell St, Ballarat. All under cover. Further details phone Kevin VK3WN (053) 35 5011.

● ICOM IC751 HF txvr with mike, manual, original carton, $1700. Yaesu FT290R all mode VHF PC shack use only with Nicads pseaker mike and bracket $510. CB txvr Cobra 148GTL with mike, hardly used $210. Comm rcvr Sony ICF2001 with power supply PC $250. Icom IC-02N HH 140-152MHz speaker mike $340. Yaesu scanner FRG9600 with manual & workhop manual, original carton, PC $770. Yagi 5el beam tribander $450. Yagi 6el beam duobander 10-15m $180. Yagi 3el 10-11 beam new $115. ATU roller coil tuner, 2kW $200. VHF 2m linear input 300mW O/P 40W $105. Monitor Scope YO0-100 PC, as new $320. BWD, CRO dual tracer 35MHz, $650. Home brewer HF linear 1kW PEP 2XQB3/300 and 2 spares $900. All antenna Werner Wulf. Harry VK3AXJ QTHR. Ph (03) 802 5704.

● TOKO hi power HL166V 6m linear $400. Kenpro 250 rotator plus 12m connecting cable $100. Hi Mound telegraph key model HK707 unused $30. Roger VK3XRS (051) 56 8291.

FOR SALE - QLD

● KENWOOD TS600 6m all mode transceiver, EC, no modifications $500 neg. Sold to licensed amateur only. John VK4KK QTHR. Ph (07) 269 6647.

● KENWOOD TS520S txvr with 3 new finals. Kenwood R1000 rx. Kenwood TS440S tcvr with PS50 20amp PS Yaesu FL1000M linear amp, no WARC bands. Sony ICF2001 port Rx. 2 Morse keys. Tandy var PS -5 to +15V Azden comm spkr. George VK4CPL QTHR. Ph (070) 54 1043.

● RF MILLIVOLTMETER probe $25. AC-DC inverter 12V to 270V 150m A. Removed from equipment $15. FET voltmeter 0.25/1.0/2.5/25/100/250V $25. Varactor Tripler 144 to 432MHz 15W in 9W out $30. RF impedance meter 0 to 800 Ω $12. Transistor tester $20. ATV TX 70cm B modules $120. RF amp solid state 10W in 40W out, 70cm $45. Norm VK4ZFQ. NOT QTHR. Ph (077) 79 4641.

● YAESU FT290R 2m all-mode Nicads, mobile bracket $400. Kenwood TH-45A case, chrgr, pwr adptr, dry-cell case $340. Commodore Plus/4 PC, cassette, joystick, built-in software, programs on cassette and cartridge $150. Theo VK4CTK QTHR.

● TS180S PS30-PS SP180-spkr MC50-MIC BLACK CTW antenna MJF Versa Tuner H Multi 7 LDM 815 dip meter. Omega TE7-02 nosie bridge $1275. Rob VK4CDQ (07) 285 5590.

FOR SALE - STH AUST

● FT101E TRANSCEIVER. Receiver Ok, faulty trans $250. Also four 6JS6C valves $10 Ea. SP102 speaker with filters $90. VK5BVJ. Ph (087) 38 0000

● YAESU FT208R 2m H/H 10 memories, mike, charger, manual, SN: IK052893 $200. Yaesu FT400 transceiver, spare new fianls, speaker, mike, manual SN: SO 53915, $300 ono. Ph (08) 381 5676.

FOR SALE - WA

● COLLINS 618T airborne HF SSB txcvr units, components & complete set. Also part repro diagrams. Write for list. VK61K Box 515 Kalamunda WA 6076.

WANTED - NSW

● ANY PAST MEMBERS or associates of Wahroonga Radio Club 1926 to 1930 or anyone with history of club is invited to contact Ian VK2WR (02) 634 7210 who would appreciate help with his research into this club.

● COLLINS KWM-2A txcvr Collins 32S-1 or 32S-3 transmitter valves 6GM6 and 6EA8 back issues of QST, Ham Radio and CQ. Contact VK2OE PO Box 1914 Wollongong NSW 2500.

● COPY OF CIRCUIT diagram & manual if available of Murphy B40 Navy Receiver and any spare tubes. Will pay all costs. Jim VK2AJT QTHR (044) 21 2786.

● FT7 txcvr in good order. Bryan Seymour, Box 55 Tumbarumba 2653. (069) 48 2904 AH.

● ONE OF THE FOLLOWING: Kenwood TS130S or TS430, Yaesu FT707, FT77 or FT757 in GC. Geoff VK2AZT any time on (069) 42 1392.

WANTED - VIC

● 120W OR GREATER AM modulation transformer. Will collect. Also MC50 mike in GC. VK3BCV Jim (054) 60 4048.

● COLLINS KWM2A T/cvr in EC. Will pay good price for right unit. Rob VK3JE (060) 37 1262 or Melb (03) 584 5737.

● AMATEURS TO HELP at the Scout Jamboree Ballarat 2-14 Jan 1992. Contact Kent VK3TER QTHR (03) 384 1610.

● BRING YOUR UNWANTED HAM GEAR to the Ballarat Hamvention Sunday 27 October 1991. Plenty of eager buyers will be waiting to purchase it. Details or to book your spot, phone Kevin Hughes VK3WN (053) 35 5011.

● ICOM IC402 or Yaesu FT790 in good order. roger VK3XRS (051) 56 8291.

● KENWOOD SP230 extension speaker, MC50 base mic. Paul (059) 83 1771.

WANTED - QLD

● MEDIUM TO HEAVY duty rotator in GC. Also desk mike for Yaesu, working or not. Ted VK4EAW (071) 28 3489.

● FOR MUSEUM PROJECT: 0-1 RF ammeter as used with WW2 AWA WS No 11. VK4YT NOT QTHR (070) 53 1952 working hours.

● BASE SK800 type for 4CX1000A in good or otherwise cond. Also push/pull valve output transformers with screen taps. John VK4TL (070) 54 3677.

● 4CX3500 4CX5000 4CX10.000 tubes and sockets, also PA cavity for FM and 220MHz. Paul VK4SY (07) 352 6645.

WANTED - SA

● HELP help who has ability to repair Telereader CWR900E computer communication system from Emtronics. Only responsible person. J Berka Box 666 Coober Pedy 5723.

WANTED - WA

● YAESU FTV107R. Lee VK6HC QTHR (09) 293 2658.

TELL THE ADVERTISER YOU SAW IT IN THE WIA *AMATEUR RADIO* MAGAZINE!

China Welcomes Aussie Amateur Radio Operators for Relief Work

On Saturday, 17 August, history was made as a team of three Australian amateur radio operators flew to China from Sydney to set up a communications base in an area devastated by the worst natural disaster this century.

Never before has China opened its borders to international aid. It is still illegal in China for individuals to own any kind of transmitting equipment, so the only radio communications are via clubs and schools.

The flood zone is, at present, totally without communications: there are no phones, no electricity. The amateur team set up two Yaesu communications stations in the disaster area, as well as two permanent stations en route: a local VHF radio station in Shanghai which will be operated by the oldest amateur there, and an international HF station in Nanjing's Middle 22 school.

In Nanjing the team gave demonstrations and training in disaster communications work to the students.

One of the team members was Ken Fuhrmeister, a licensed operator and an employee of Dick Smith Electronics. Ken runs the amateur shack which operates out of the Bourke Street (Melbourne) store as part of the company's ongoing commitment to the amateur radio market, and will be putting some of the company's equipment to valuable use in China.

Ken has had experience working with Australian disaster relief teams, but this was his first international experience. "We are a little apprehensive," he said, "as there are **no** communications in the disaster area, and no one really knows what's going on. But the Chinese Government is being very supportive of our expedition, and we are hopeful that we can achieve some meaningful results."

The team left from Sydney International Airport on the CAAC flight at 1150 on Saturday, 17 August, to be met on their arrival by the Governor of Gangsu Province, the flood-devastated area. **ar**

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300,
Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

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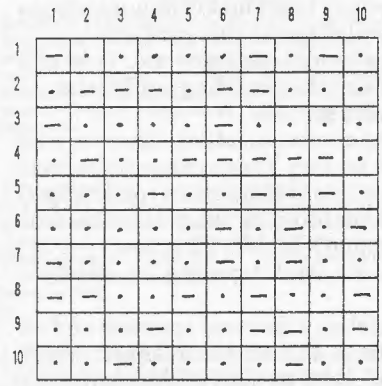
Solution to Morseword No 55 P 39



Across: 1 earl; 2 enemy; 3 merge; 4 reds; 5 gale; 6 race; 7 steak; 8 last; 9 fix; 10 isle.

Down: 1 Innes; 2 atol; 3 bier; 4 hits; 5 Mons; 6 real; 7 wry; 8 cab; 9 leis; 10 lug.

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It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

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All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the boxholder or seller of the goods.

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VK2BWI nightly at 0930 UTC on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3RCW Continuous on 144.950 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200UTC on 3.555 MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 Mhz

The Tradition Continues...

YAESU FT-990 HF ALL-MODE TRANSCEIVER

Take a quick look at the all-new FT-990 and you'll soon see the similarity to the top-of-the-line FT-1000... and for good reason. The incredible FT-990 embodies many of the advanced features and ease of operation of the FT-1000. But in a more compact, economical package that sports several new advances in both transmitter and receiver design.

2 YEAR WARRANTY!

Designed For Easy Operation

Just like the FT-1000, Yaesu have designed the FT-990 to be as easy as possible to operate. The front panel layout puts all frequently used controls right where they should be..... at your fingertips. All controls are clearly labelled and the digital display provides an abundance of information in an uncluttered and easy to read format. The front panel keypad offers one-touch band selection (160m - 10m) with 2 independent VFOs per band and 90 memories that store the operating data held in both VFOs. You can't help but appreciate the large back-lit analogue meter rather than those confusing bar-graph meters found on other transceivers.

Direct Digital Synthesis (DDS)

Two 10-bit DDS and a magnetic rotary encoder provide silky-smooth VFO tuning, pure local oscillator signals, and very fast Tx/Rx change-over... and that's very important for QSK CW and digital modes. The DDS is teamed with an extremely low-noise, high performance receiver front-end using a PIN-diode controlled push-pull RF amplifier followed by a quad-FET ring mixer. The result is a very wide receiver dynamic range from 100kHz to 30MHz. Transmitter signal purity is also enhanced, with circuit noise nearly 90dB down from the carrier.

Unique Features

- Customizable RF Speech Processor - Yaesu's unique Frequency Shifted Processor (FSP) lets you shift the IF passband of your transmitted SSB signal to provide maximum punch with your voice/microphone combination.
- Digital Audio Filtering - Razor sharp audio filtering is available for tough SSB and CW reception conditions through the use of an astounding dual digital Switched Capacitance Filter (SCF) with independently adjustable selectivity skirts.
- Packet/RTTY - Separate interface jacks for a RTTY terminal unit and a Packet TNC are provided, while the mode selection buttons disable the mic automatically in the digital modes.

Convenience Features

- A highly efficient AC switch-mode power supply is built-in! It allows high duty-cycle transmission while keeping the weight way down, saving space and the added expense of external power supplies.
- An in-built Automatic Antenna Tuner with 39 memories is standard!
- Modular construction maximizes selectivity and makes servicing easy.
- Effective interference rejection is facilitated by IF shift, IF notch, IF bandwidth and SCF audio controls.
- An adjustable noise blanker, a 500Hz B/W IF crystal filter and a comprehensive, easy to read user manual are also supplied.

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